JUNE 1949
69th Year

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING

SMCNA 1949 officers: P. W. Olmen, Chicago, president; C. M. Gundlach, Sandusky, treasurer; E. B. Brown, Jr., Chicago, 3rd vice president; A. F. Richter, St. Louis, director; W. A. Wiedenmann, Kansas City, 1st vice president; Lester Peterson, Duluth, director; Frank Kramer, Milwaukee, 2nd vice president; Ernest Blattmann, New Orleans, director.

- Ernest Fair discusses employee relations, one of today's storm centers. See Page 77.
- An installation of panel-convection heating in Southern California is described on Page 83.
- A new series explaining the application of electronics to control systems starts on Page 86.
- Some fundamental facts on correct lighting for efficient production will be found on Page 99.

MORE JOBS PER WEEK...

MORE PROFIT PER HOUR..

with Simplenic* simplified INSTALLATIONS

Write today for the new Lamneck comprehensive catalog and the name of your nearest jobber.

Jobs *figure* faster, *sell* faster, *finish* faster with Simplenic system forced air duct work . . . and here's why. The main trunk requires *no* increasers or reducers (width for *full* length of 8" duct = total take-off openings x 2 plus 2"), and only 4 types of duct fittings are required. This *simplification* saves 30% on duct material and 25% on labor — lowers competitive costs and *increases* labor hour productivity! So *win* more sales — do *more business* per man — *you* take the profit, and any credit due Simplenic we'll be glad to get by way of your continued trade!

CLAYTON & LAMBERT MFG. CO.

1760 DIXIE HIGHWAY • LOUISVILLE 10, KY.

*©T. M.

ANOTHER GREAT C&L PRODUCT

Lamneck TRADE MARK

FURNACE PIPE AND FITTINGS

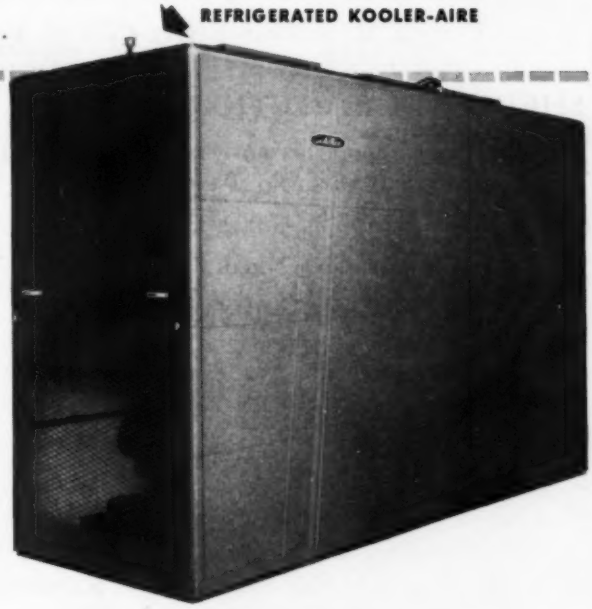
Sales notes from usAIRco Dealers . . .

HOTEL SALES PROBLEM

Client had long wanted to air condition 115 of his higher priced rooms, but feared cost of building alterations. He was sure ductwork would lower ceilings too much and occupy rentable floor space. Also, he didn't like the idea of having those high premium rooms closed to guests all the time installation was going on. He told us not to bother him unless we could solve all his problems at once.

usAIRco SOLUTION

We told him immediately about usAIRco Modu-aire. We explained how this low cost multi-unit system is installed without space-wasting ductwork . . . how easily the necessary plumbing is installed without interfering with room rentals for more than a day or so . . . how each Modu-aire unit is equipped with coil for both cooling and heating . . . and how each room occupant may select his own temperature . . . how Refrigerated Kooler-aire Model C furnishes abundant chilled water for Modu-aire installations. We gave him his choice of the Modu-aire recessed unit or the free-standing model. In other words we solved all his air conditioning problems at once . . . with Modu-aire. He signed the order.



SUPER MARKET SALES PROBLEM

Proprietor has wanted air conditioning for a long time but kept running into bothersome problems. City wouldn't give him a permit to sink a well due to water shortage. Superintendent of building claimed roof wouldn't support a tower without costly structural changes. Very limited space available to install plant. Said he was losing money not having air conditioning but didn't see how he could overcome these factors.

usAIRco SOLUTION

We told him he didn't need a well . . . didn't need a roof tower . . . didn't need any more space than he had to install a usAIRco Refrigerated Kooler-aire. We explained that Refrigerated Kooler-aire is the automatic "central plant" unit that's compacted into a single small cabinet. We showed him how its built-in evaporative condenser saves up to 95% on water consumption . . . without a roof tower. We pointed out to him that Refrigerated Kooler-aire moves in through average size doors so walls needn't be ripped out . . . how it's installed with only three simple connections. We took him to inspect other RK installations we'd made in town. We finished his RK installation last week.

Your Sales Problem

may be different from either of these . . . but whatever it is that's keeping your prospect from buying air conditioning equipment, the chances are you'll find a usAIRco unit to turn every one of his objections into a strong, positive selling point. Next time you find yourself wrestling with a reluctant prospect, let us know. We're usually able to help you get the order.

usAIRco

UNITED STATES AIR CONDITIONING CORPORATION • Como Ave. S. E. at 33rd Minneapolis 14, Minn.

AMERICAN ARTISAN

RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

Member—Audit Bureau of Circulations
Member—Associated Business Papers

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Founded 1880

JUNE, 1949

Volume 118, No. 6

Frankly Speaking

SYNCROMATIC

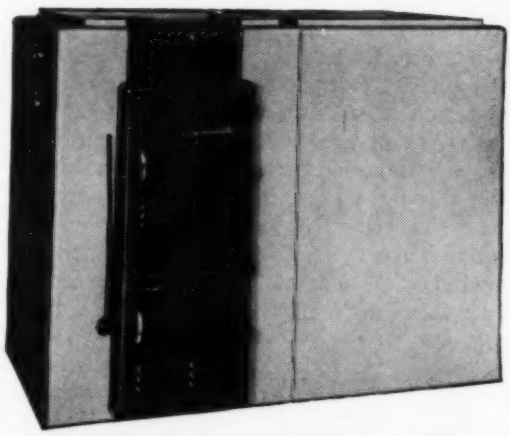
has Everything

Efficiency-Beauty-Safety-Economy...

in WARM AIR HEATING-*All at Low Cost!*

CFB COAL FIRED UNIT

Only Syncromatic has this design . . . the result of intelligent and logical application of the "COUNTER-FLOW" principle and a completely and unparalleled Front construction . . . GROUND FIT DOORS COMBINED WITH VENTILATED STEEL CABINET SHIELD. The only coal unit made that can be converted to high efficiency oil firing.

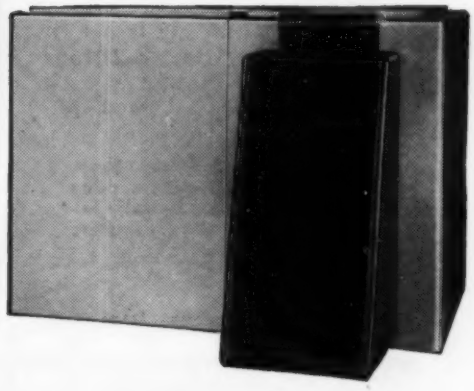


Syncromatic COUNTER FLOW

PRINCIPLE MEANS PERFECTION IN HEATING EFFICIENCY

GFB GAS FIRED UNIT

A complete range from 75,000 to 240,000 BTU. All heat exchangers built of heavy 10 gauge corrosion resisting steel. "COUNTER-FLOW" principle as used in all Syncromatic Furnace Units.



OFB OIL FIRED UNIT

The Syncromatic Oil Fired Unit employs the "COUNTER-FLOW" principle in warm air heating . . . one of the most efficient methods of heat transfer known. Compact and completely welded heavy gauge heat exchanger . . . your best insurance for safety and long life. Just compare the gauge and construction of Syncromatic with any other oil-fired unit.

Syncromatic Corporation

WATERTOWN, WISCONSIN

"TAILOR MADE" for Your Home!

The "True Economy" Home Uses

VITROLINER CHIMNEY

The Vitroliner type "E" Flue is a time-tested, proven practical, complete chimney designed to take care of all home heating equipment and venting requirements—used by large national builders and small contractors.

This pre-fabricated Packaged Chimney is supported entirely from the ceiling and roof and requires no brickwork. Practical in all residential ranch type construction, especially where space is at a premium. Ideal for single story industrial and commercial buildings. Available individually or in any quantity.

- **Completely Fabricated**
- **Underwriters' Listed for All Fuels**
- **Used in F.H.A. Construction**
- **Low Initial Cost—**
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- **Weight — 10 Lbs. Per Foot**
- **Improves Heating Performance**
- **Saves Floor Space—2 Hour Installation**

Attention, Heating and Sheet Metal Men — Here is your opportunity to economically install a heating plant complete with chimney.

Write today for details. Dept. A-6

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122 South Michigan Avenue, • Chicago 3, Illinois
MFRS. OF VITREOUS ENAMELED PIPE FOR 20 YEARS

Paging Arnold Kruckman

We enjoyed reading Arnold Kruckman's WASHINGTON LETTER on small business in the April issue.

There are some points in his letter we would like to discuss further with him and would be pleased if you would furnish his mailing address.

HAROLD M. WHITAKER

Whitaker and Mattson
Rapid City, S. Dak.

We shall gladly transmit comments and letters of inquiry to Mr. Kruckman because he does not maintain secretarial services. However, his address will be sent to any reader who requests it. If the subject is not personal, a copy of the correspondence is appreciated as we are always interested in our readers' viewpoints about subjects discussed in our editorial pages. —ED.

Reference is made to Arnold Kruckman's WASHINGTON LETTER in the March issue. I am trying to reconcile the figures quoted. For example, it states that "each taxpaying family pays $3.70 per month towards the rent of each of the families who occupy the 1,050,000 public housing units; and it means each taxpaying family *contributes this bit towards the monthly rental for 40 years,* or makes the contribution during the 40 years at the rate of $44.50 per year per taxpaying family, which totals an aggregate of $17,000 per taxpaying family."

First of all, $3.70 per month amounts to $44.40 per year. This amount multiplied by 40 totals $1776.

Am I failing to comprehend an important factor in the calculation of the $17,000? Or, is this $17,000 an attempt to influence your readers against the bill?

J. W. SMITH

Allison Park, Penn.

The discrepancy between $44.40 and $44.50 is negligible; the figures were rounded off for convenience. Also, the amount $17,000 was rounded off, except in this case the error in the location of the decimal point was not detected in proofreading. We attempt to reconcile all calculations and when this error was called to Mr. Kruckman's attention, he pointed out in his reply that the amounts involved in this housing legislation are so astronomical that they befog and confuse.

LOCKFORMER *"figures"* look mighty nice too!

FIGURE NO. 1

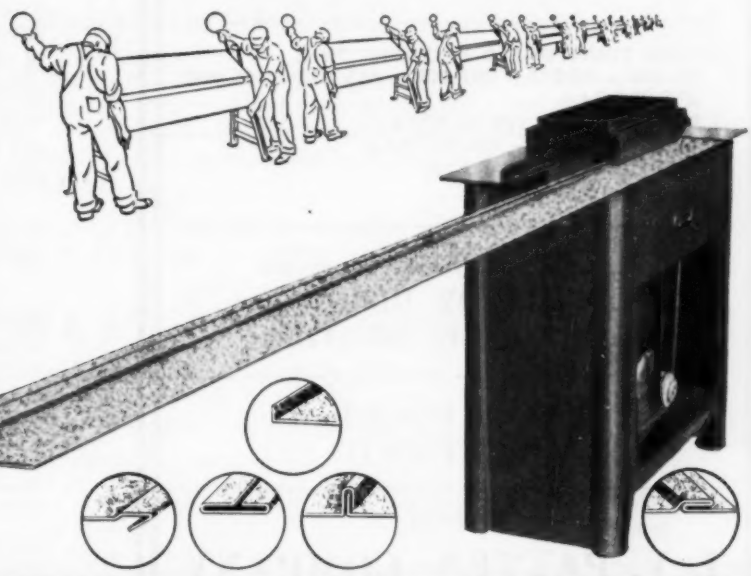
LOCKFORMERS
save up to 90% in seam making

FIGURE NO. 2

LOCKFORMERS
cut over-all fabrication costs
IN HALF!

Lockformer equipment has become the "standard" of the Industry simply because it has proven to be the best, fastest and cheapest way to seam metal. For the kind of "figures" you like to see in *your* Profit Statement, *use a Lockformer!*

ONE MAN WITH A
LOCKFORMER
MAKES MORE
PITTSBURGH LOCKS
THAN SIXTEEN MEN
WITH EIGHT BRAKES



THE LOCKFORMER CO.
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FUEL MASTER
OIL or GAS BURNING FURNACES

TAILOR-MADE QUALITY
for the
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NEW UNITS — NEW DESIGNS
BETTER THAN EVER!

6 SIZES COUNTER-FLO BASEMENT TYPE
65,000 - 85,000 - 100,000 - 135,000 - 165,000
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3 SIZES UTILITY TYPE HI-BOYS
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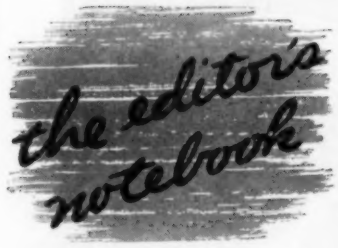
COUNTER-FLOW HI-BOYS *for*
FLOOR PANEL HEATING

Built and Priced for
YOUR PROFIT

Write

J. V. PATTEN COMPANY
Sycamore, Illinois
Originally Established in 1898
Incorporated in 1928



This conclusion is borne out by the fact that when the correct amount, $1,700 per taxpaying family, and $17,000, as quoted in the article, are extended, the discrepancy amounts to $100 million which represents only ½ of 1 per cent of an aggregate of $20 billion which, in round figures, has been referred to in official releases as the ultimate cost of the housing program.—ED.

Proof Positive

Thank you very much for mentioning the two slide films in the EDITOR'S NOTEBOOK (AMERICAN ARTISAN, March and April). Since these items appeared we have received requests for these films from all over the country. In fact, we have had to order five additional sets of "It's Comfort They Bought" to meet the demand. At the present time we have a small waiting list.

We are happy to make these films available to the warm air heating trade.

JAMES M. MARTIN
National Warm Air Heating
& Air Conditioning Association
Cleveland, Ohio

Likes Wholesaling Article

. . . I am thankful that AMERICAN ARTISAN published such a fine article ("Heating Wholesaler—Distribution's Driving Force," by William H. Rigby, April), and realize that it is not an article simply boosting the trade of the wholesaler, but the type of explanation of our American system which helps show the general public how business in this country is run.

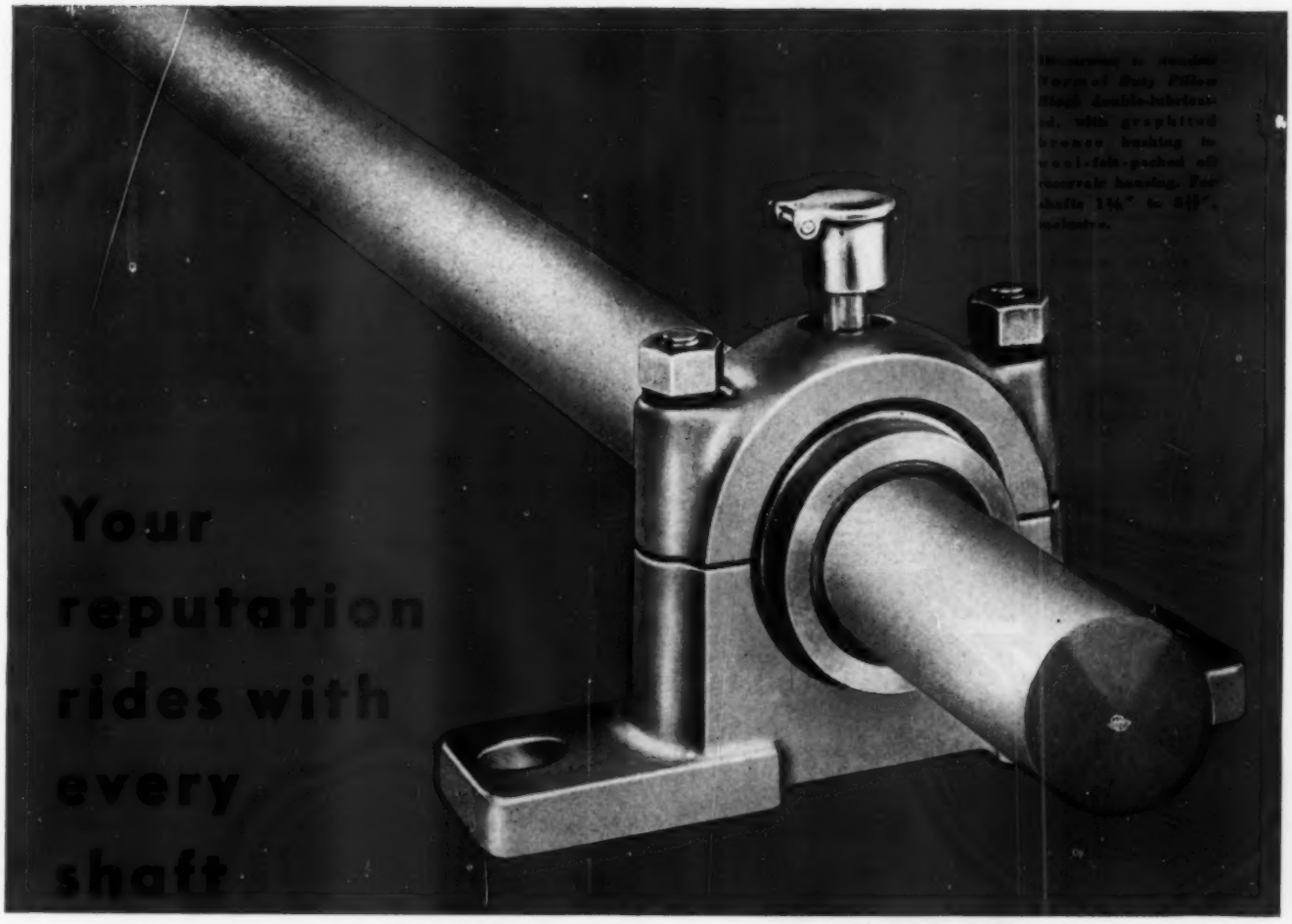
Congratulations for your fine article, Mr. Rigby, and for its publication in AMERICAN ARTISAN.

A. M. VORYS
Vorys Brothers, Inc.
Columbus, Ohio

Steel Supply Ample

Wilfred Sykes, retiring as president of Inland Steel Company, told stockholders at their last annual meeting that there is ample evidence that the pent-up demand for steel which existed immediately following the war is now being satisfied and that the steel industry's present capacity will prove more than sufficient to supply the needs of the country, even at maximum peacetime consumption.

In what he termed "the last occasion that I shall address you as president," Mr. Sykes reiter-



That's why it pays to standardize on self-aligning, self-lubricating *economical* Randall Pillow Blocks

Make sure of quiet, efficient operation, for the life of the equipment. Specify Randall Pillow Blocks on every job. Installation is quick and easy. Shafts roll silently, month after month, on self-lubricating graphited bronze or sintered bushings in wool-felt-packed oil reservoir housings.

Write for Catalog 49, with data on Randall's complete line of six basic pillow block types . . . *right* for every air handling need.

RANDALL GRAPHITE BEARINGS, INC.

609 West Lake Street, Dept. 611, Chicago 6, Illinois

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MOFFATT BEARINGS COMPANY
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SYRACUSE BEARING COMPANY
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TEK BEARING COMPANY
Albany, Boston, Bridgeport, Newark, New York, Providence, Waterbury

SALT LAKE HARDWARE COMPANY
Salt Lake City 9

CANADA

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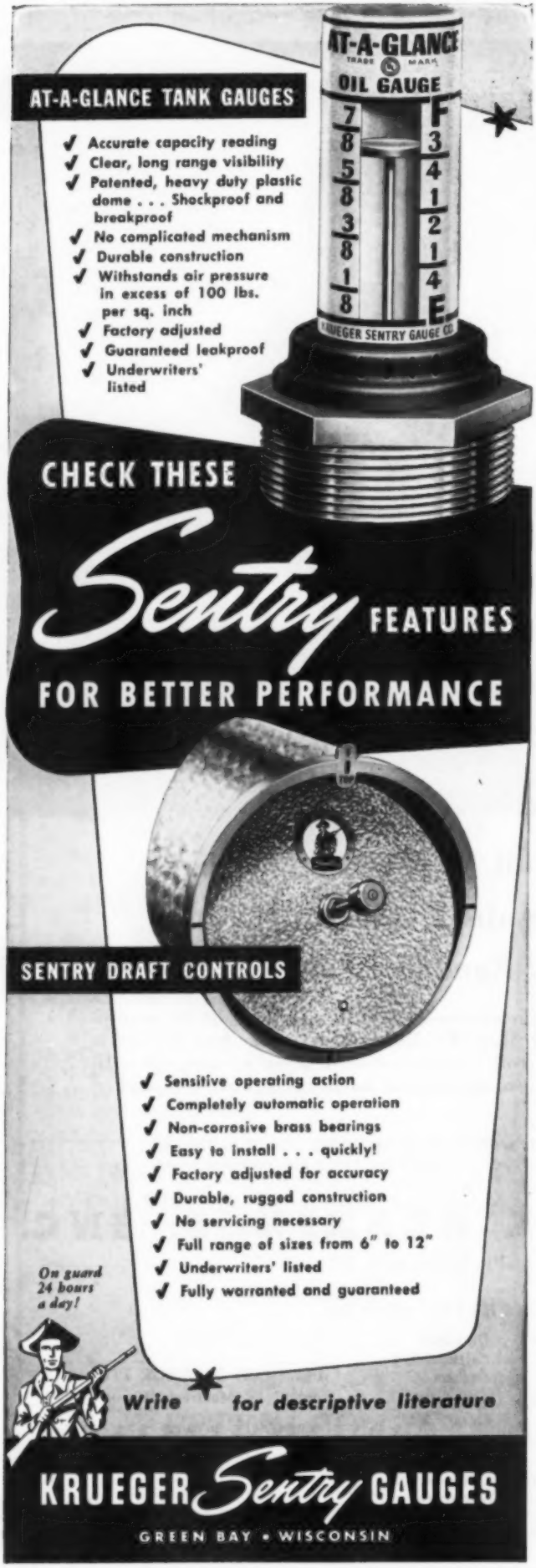
PUMPS & POWER, LTD.
Vancouver

CUBA

GOYANES y ALVAREZ
Havana


AT-A-GLANCE TANK GAUGES
✓ Accurate capacity reading
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✓ Patented, heavy duty plastic dome . . . Shockproof and breakproof
✓ No complicated mechanism
✓ Durable construction
✓ Withstands air pressure in excess of 100 lbs. per sq. inch
✓ Factory adjusted
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OIL GAUGE
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CHECK THESE
Sentry FEATURES
FOR BETTER PERFORMANCE
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✓ Completely automatic operation
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✓ Underwriters' listed
✓ Fully warranted and guaranteed
On guard 24 hours a day!
Write for descriptive literature
KRUEGER Sentry GAUGES
GREEN BAY • WISCONSIN

the editor's notebook

ated his firm's opposition to the f.o.b. mill pricing system adopted by the industry following the Supreme Court's ruling on base pricing and emphasized the fact that there is definite evidence at this time to show that the government sponsored steel allocation programs will serve no useful purpose. He declared there will be no further need for government interference with the normal distribution of steel.

The record breaking output of the steel industry in the first quarter of this year raised the total production of raw steel in 12 successive months to more than 90 million tons, more than ever produced in a like period.

Community Parades and Floats

Our community is planning a parade consisting of floats, marching assemblies, etc., in the near future and we are thinking of entering a float. Have you any suggestions as to what might be representative of our line of business? We are general sheet metal contractors doing heating and ventilating, exhaust systems, air conditioning, and complete repair work. We do not want to enter something that will accent only one particular phase of our work. We have had in mind a metal robot made of stainless steel.

RONALD F. DUVAL

E. T. Duval & Sons
Leominster, Mass.

Readers are invited to send us photographs of floats and other public relations activities for publication.—ED.

Bombs for Furnaces

Would you please inform us where we may purchase smoke bombs for testing furnaces?

A. T. DINGELDEIN

A. T. Dingeldein Co.
Springfield, Ohio

Can you supply us with the name of a manufacturer of smoke bombs for testing warm air furnaces for leaks?

R. H. HOOD

Hood Furnace Co.
Elmira, N. Y.

Will you please send me any information you may have on a source of supply for smoke guns used for checking air distribution?

J. B. RUSSELL

Interstate Sheet Metal Works
Sioux City, Iowa

The Honeywell Outdoor Compensator... Varies Forced Warm Air Heating Plant Temperatures with the Weather

A MUST FOR EVERY ZONE CONTROL JOB

THE T418A Outdoor Compensator maintains the temperature in forced warm air heating plants in accordance with outside weather. Functioning as a primary control, it automatically varies the control point setting, increasing it in colder weather and reducing it in warmer weather to provide delivery of the required degree of heat throughout the system.

This unit is an essential must for zone control. It provides varying heating plant temperatures in direct accord with the weather and eliminates the necessity of maintaining high bonnet temperature to satisfy the most severe requirements, thus eliminating high standby losses in mild weather.

For radiant panel heating in low cost housing, the Outdoor Compensator is a highly satisfactory alternate where the budget will not permit use of Electronic Moduflow—regarded as the finest control system available for this modern type of heating.

MINNEAPOLIS
Honeywell
CONTROL SYSTEMS

Investigate the T418A Outdoor Compensator for every type of forced warm air job. Call your nearest Honeywell branch office for complete information and wiring diagrams. Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Leaside, Toronto 17, Ontario.

73 BRANCHES FROM COAST TO COAST WITH SUBSIDIARY COMPANIES IN: TORONTO • LONDON • STOCKHOLM • AMSTERDAM • BRUSSELS • ZURICH • MEXICO CITY

Sundstrand
OIL BURNERS

• Flange mounted
• Variable tube lengths to fit your particular requirements

A2

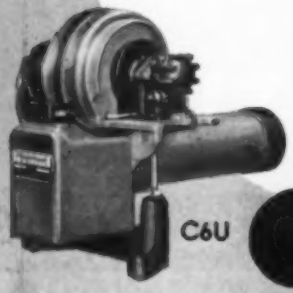
ALL SURFACES MACHINED
PRECISION MADE THROUGHOUT
COMPLETELY FIRE TESTED

A2

the "CUSTOM-BUILT" LINE for forty-nine

B4

B5



C6U

meet all local and state requirements

WRITE US FOR COMPLETE INFORMATION

SUNDSTRAND ENGINEERING CO.
ROCKFORD • ILLINOIS

the editor's notebook

We are trying to locate a sort of bomb-like contrivance used for starting coal fires. As we understand it, when two or three are ignited and tossed into a firebox, enough heat is released to ignite the surrounding particles of coal.

We have been told by several persons that such an item has been manufactured, but we have not been able to locate either the name of the product or the manufacturer.

EDWIN C. WHITTEMORE
Bennet, Walther & Menadier, Inc.
Boston, Mass.

We have a list of manufacturers who make smoke bombs and will gladly furnish it upon request.

The product described in the last letter appears to be a form of an incendiary bomb. We cannot locate a company who makes a bomb suitable for the purpose outlined.—ED.

Welcome to Visitors

If there is any business-like equivalent of Walter Winchell's orchid, we would like to present it to the Crescent Tool Company of Jamestown, New York, for their little booklet entitled "Welcome to Crescent Tool Co.," which is handed to every visitor who enters the company offices.

For the convenience of all visitors, whether salesmen, customers, or just interested spectators, Crescent has smoothed the way to interviews by providing a complete list of officials and department heads, including full names and titles.

Made to order for salesmen is the What We Buy list, attended by a little note of cheer saying that the list is only a partial one and that they are always interested in new products! Come to think of it—that's not just being polite, its open-minded and progressive. Crescent is taking no chances on missing new developments which might be an important factor in stepping up production or sales.

In addition to all this pertinent information about the inner workings of the company itself, the booklet offers a map of highway routes leading from the plant to Buffalo, New York City, and other important points. In case you are not driving, the following page hastens to add that you may obtain all train schedules without leaving the premises.

By and large, this Welcome booklet is one of the best combinations of courteous service and institutional advertising that has come our way.

YOU'RE MONEY AHEAD

WHEN YOU SELL THE LEADER!

These features boost sales and profits

- **HIGH EFFICIENCY**
- **LONG LIFE**
- **ACCEPTANCE**
- **ADVERTISING SUPPORT**
- **REASONABLE PRICE**
- **GOOD PROFIT**

No question about it, you make more money when you sell the filter that has *all* the advantages. Just consider what DUST-STOP Air Filters offer:

HIGH EFFICIENCY—Smooth glass fibers offer minimum resistance, maximum dust-holding surface. Resist shedding. Cannot compress to block air flow.

LONG LIFE—More than a strainer, DUST-STOP has an adhesive with extraordinary "wetting action". It quickly saturates trapped particles, maintains high efficiency until dirt load requires replacement.

ACCEPTANCE—Long established as the leader, and original equipment in most modern warm-air furnaces, DUST-STOP is the logical replacement.

GOOD PROFIT—Substantial dealer margins plus fast turnover make DUST-STOP highly profitable, a good product to push.

Your DUST-STOP distributor or jobber will be glad to give you details on these features, as well as on DUST-STOP advertising and promotion support. Contact him today. Owens-Corning Fiberglas Corporation, Dept. 930, Toledo 1, Ohio. In Canada, Fiberglas Canada Limited, Toronto, Ontario.

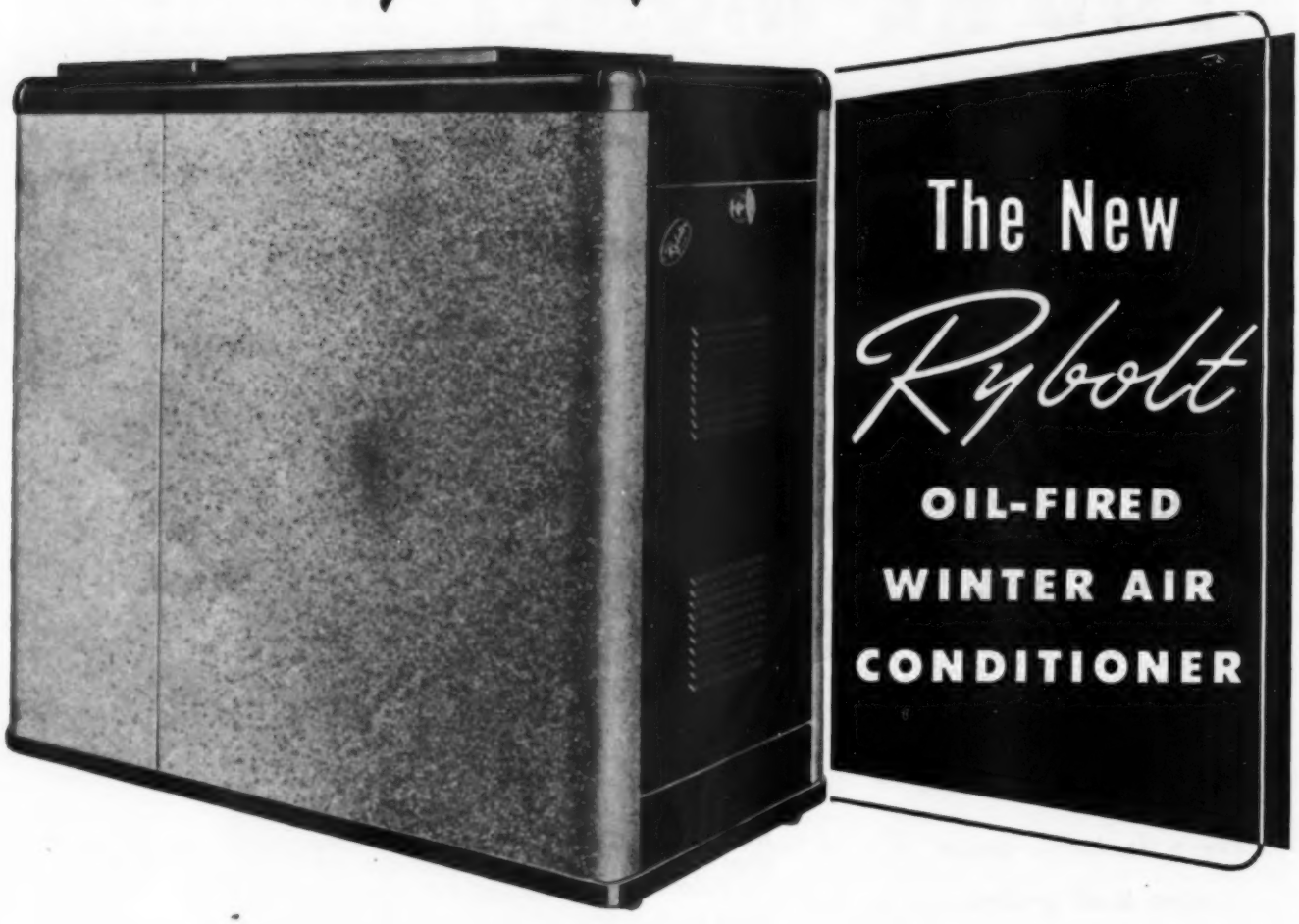
DUST-STOP* **AIR FILTERS**

*T. M. REG. U. S. PAT. OFF.

— a FIBERGLAS* product

*DUST-STOP is the trade-name of Owens-Corning Fiberglas Corporation for impingement-type air filters made of glass fibers. FIBERGLAS is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for a variety of products made of or with glass fibers.

It's Completely Automatic!



● For the home owner who prefers oil heating the new Rybolt Oil-Fired Winter Air Conditioner offers unusual convenience, comfort and economy.

It is completely automatic—a feature that will prove a powerful sales appeal to your customers. Once installed and set for the desired temperature the home owner can be assured that it will continue to provide even comfortable heat throughout the house, as long as it receives the ordinary attention and service required by any mechanical appliance.

The burner, unusually efficient, practically trouble-free and easy to service was designed by engineers who have specialized in oil burner construction for more than a quarter century.

Fully enclosed in an attractive cabinet, finished in two-toned baked enamel, the burner controls and top mounted blower are completely concealed and protected, yet accessible for quick and convenient servicing.

It's another Rybolt unit you'll be proud to handle because it insures lasting heating satisfaction and economy.

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

Write for attractive folder.

THE RYBOLT HEATER COMPANY

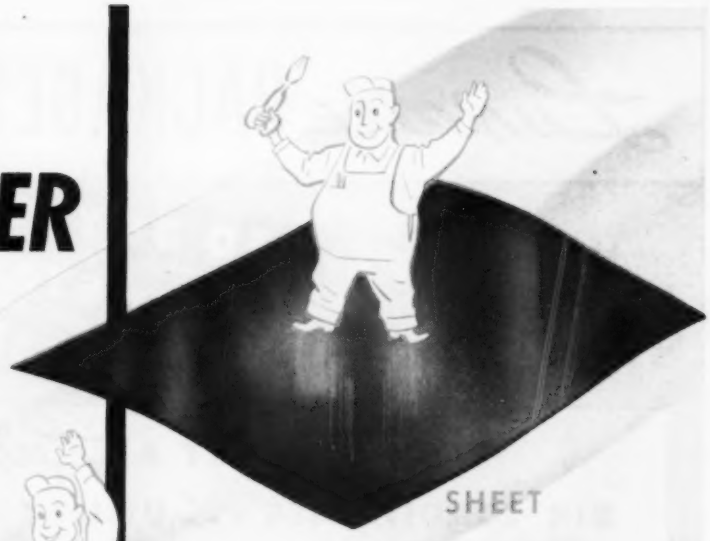
615 MILLER STREET ★ ASHLAND, OHIO

USE ALL THESE FORMS

OF HUSSEY COPPER

to simplify

your production



BRASS

HUSSEY

COPPER

101ST YEAR

C. G. HUSSEY & COMPANY

(Division of Copper Range Co.)

Rolling Mills and General Offices:

PITTSBURGH, PA.

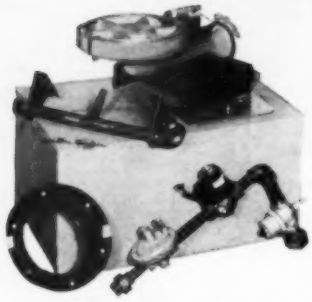
Hussey Warehouses Carry Stocks of Copper and Brass Products for Prompt Delivery

Luxaire PACKAGES your Heating Problems!

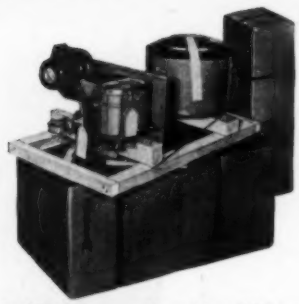
WITH SIMPLIFIED BUYING!
SIMPLIFIED INSTALLATIONS!
SIMPLIFIED INVENTORIES!

WHEN YOU BUY A Luxaire PACKAGED AIR CONDITIONER . . . UTILITY or GRAVITY UNIT THAT'S DESIGNED . . . BUILT and APPROVED for GAS OR OIL FIRING . . . WITH Luxaire's PACKAGED PRESSURE VAPORIZING OIL BURNER OR Luxaire's PACKAGED GAS BURNER.

Assembled Unit, crated, ready for shipping.



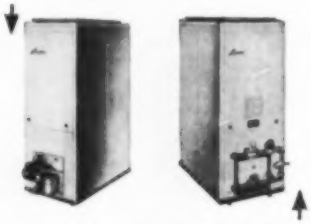
Packaged Gas Burner assembly, complete with all controls, necessary parts and fittings for complete installation.



Packaged Pressure Vaporizing Oil Burner, complete with all controls, necessary parts and fittings for complete installation. Burner is factory assembled and adjusted.

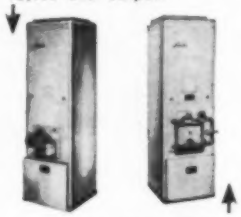
THESE ARE THE COMBINATIONS YOU GET WITH *LUXAIRE'S* COMBINATION OIL or GAS PACKAGED UNITS.

Series VA-65. Oil Fired Air Conditioning Unit. 76,000 Btu Output.



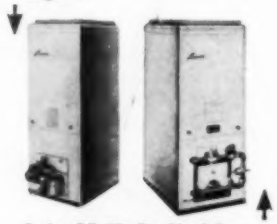
Series GA-100. Gas Fired Air Conditioning Unit. 100,000 Btu Input.

Series VH-75. Oil Fired Utility Air Conditioning Unit. 75,100 Btu Output.



Series GH-95. Gas Fired Utility Air Conditioning Unit. 95,000 Btu Input.

Series VG-61. Oil Fired Gravity Furnace. 60,600 Btu at Register.



Series GG-85. Gas Fired Gravity Furnace. 85,000 Btu Input.

Series VHC-75. Oil Fired, Counter Flow Air Conditioning Unit with Blower in top of Cabinet for floor panel heating. 75,100 Btu Output.

Series GHC-95. Gas Fired, Counter Flow Air Conditioning Unit with Blower in top of Cabinet for floor panel heating. 95,000 Btu Input.

THE C·A·OLSEN MANUFACTURING COMPANY

Luxaire HEATING & AIR CONDITIONING UNITS

ELYRIA 12, OHIO

THIS NEW LOW COST INSULATION IS THE GREATEST THING YET

Here is insulation of a kind never known before, that will let you handle jobs that formerly took a combination of insulation and sound-deadening materials. It's the first real *all-purpose* insulation. And it's low in cost . . . material cost, labor and maintenance.

Apply Fiberglas* "Aerocor"* by any of the usual methods . . . die-cut it, cut it with a knife or with scissors; fit it around irregular shapes or wrap them up in it; tack it on, cement it, sew or tape it.

Fiberglas "Aerocor" is exceptionally lightweight . . . as low as 0.3 pound per cubic foot . . . yet is high on sound-deadening and thermal insulation values. You can safely use "Aerocor" for applications up to 600°F. . . . its glass fibers won't burn, won't feed vermin or rodents, can't rot. "Aerocor" stays put without sagging and fluffing off.

You will find dozens of uses for this wonder insulation. Mail the coupon below for a sample of Fiberglas "Aerocor" and the booklet of data and specifications. And we'll gladly direct you to your local supplier. Owens-Corning Fiberglas Corporation, Dept. 930, Toledo 1, Ohio.

*FIBERGLAS (REG. U. S. PAT. OFF.) AND AEROCOR ARE THE TRADEMARKS OF OWENS-CORNING FIBERGLAS CORPORATION FOR PRODUCTS MADE OF OR WITH GLASS FIBERS

OWENS-CORNING FIBERGLAS

A NAME THAT MEANS EXTRA VALUE IN INSULATION

Owens-Corning Fiberglas Corp.,
Dept. 930, Toledo 1, Ohio.

☐ I am interested in using Fiberglas "Aerocor" for_____

_____

☐ Please send me a sample of Fiberglas "Aerocor" and complete information.

Name _____

Firm _____

Address _____

_____

Every House Needs COPPER to cut Maintenance Costs

THERE ARE mighty good reasons for using copper to flash a home. It takes just as much labor to install less permanent material. Hence, the intelligent home owner is quick to see the ultimate saving and extra security of copper. And quick to appreciate the service of the contractor who installs it.

On the job, copper is easy to work with. It's readily formed and soldered. It possesses adequate strength and toughness. Yes, there's extra satisfaction in doing any job the way you know it *should* be done.

SPECIAL NOTES—1. Standing seam entrance hoods give you a profitable source of extra business. 2. The concealed window flashing shown above is thin, electro-deposited copper bonded to building paper.

ANACONDA
Brass Mains by Consumer

Anaconda

SHEET COPPER

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

MOST HEATING SYSTEMS END UP BY *WARMING THE AIR*

WHY NOT BEGIN WITH IT?

DRAVO *Counterflo* HEATERS

Dravo *Counterflo* Heaters provide a highly efficient heating method for open area structures. This method is efficient because it heats the air right where it's to be used and without employing water or steam as intermediaries.

No "conversion" losses with Dravo *Counterflo* Heaters on the job. The heater warms the air, and the positive, directed circulation floods the working zone with warmth. Burns oil or gas as fuel—can be readily converted from one to the other. Low fuel cost—80 to 85% efficiency. Low installed cost—users report 50 to 66% less investment than in standard wet type heating systems. Immediate delivery, quick, easy installation, no delays due to pipe shortages. Thousands of successful installations. Write for Bulletin CD-523-3

DRAVO
CORPORATION
DRAVO BUILDING, PITTSBURGH 22, PA.

Dravo also manufactures the *DRAVO CRANE CAB COOLER* for air conditioning hot-metal crane cabs.

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK • CHICAGO • ATLANTA • BOSTON

Sales Representatives in Principal Cities. Mfd. and Sold in Canada by Marine Industries, Ltd., Sorel, Quebec.

DRAVO

Inexpensive smaller sheet metal machines built with the SAME PRECISION as large costly ones

BECAUSE smaller machines such as foot-operated squaring shears and hand-operated slip roll formers, do a Lion's share of work in many sheet metal shops, Wysong and Miles builds them with the same care and precison that go into the construction of a large power machine.

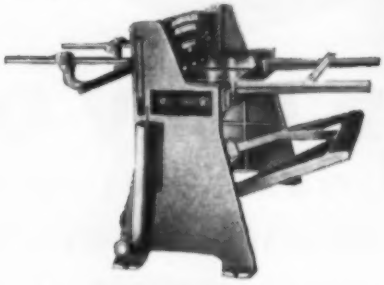
Jigs and fixtures are used in the machining and drilling of every part to insure accurate fit. On manually operated machines, leverage is carefully balanced for operation with minimum effort. Each component part is built to carry a greater stress than required by any possible load. Each machine is designed and built for long, accurate service under all operating conditions within rated capacity.

Through the operation of their own foundry and other production line economies, the initial cost of Wysong and Miles sheet metal machines is surprisingly low. Simplicity of design and precision in construction mean economical maintenance and operation.

WRITE for CATALOG No. 22 giving full information on Wysong and Miles sheet metal machines . . . Power and foot-operated squaring shears, power and hand operated slip roll formers, and combination sheet metal machine.

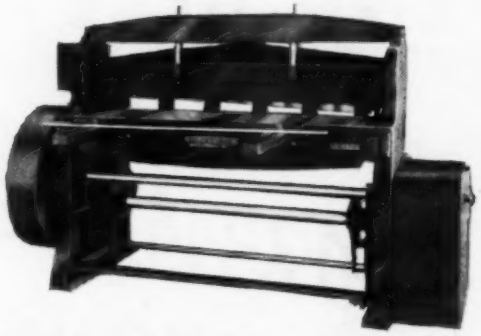
COMBINATION MACHINE

Furnished with interchangeable rolls. This one machine is used for burring, turning, beading, wiring, crimping, slitting, elbow edging and other operations. With special attachments it is also used for circle cutting and flanging.



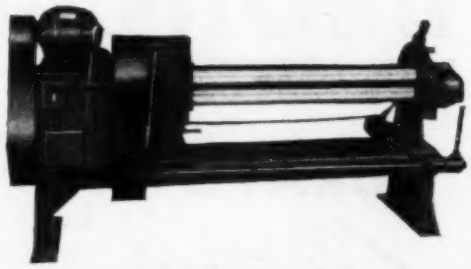
400 LINE OF FOOT-POWER SQUARING SHEARS

Capacities 36" through 52" in 16 and 18 gauge. Rugged and fast shears that cut accurately without twist or spring . . . Other foot shears in 8', 18 ga. with self-locking, hand-operated holddown.



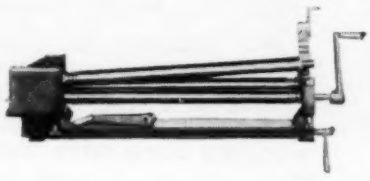
NO. 552-A, CAPACITY 52", 12 GAUGE, MILD STEEL

For accurate cutting, holddown and knife-bar travel in hand-scraped slides. The perfect slide bearing prevents rocking or deflecting . . . Other power squaring shears in 10 foot, 10 gauge; 8 foot, 3/16", 10 and 12 gauge; 6 foot, 10, 12 and 14 gauge.



POWER SLIP ROLL FORMING MACHINES

5" rolls in 48", 60", 72", 96" and 120" lengths. Initial type rolls. All rolls are gear driven and maintain the proper mesh at any setting. To save steps, roll lifting and locking levers are together on right hand end of machine.



HAND OPERATED SLIP ROLL FORMERS

2" rolls in 30", 36" and 42" lengths, 2½" rolls in 36" and 42" lengths, 3" rolls in 48" lengths. Can be used as bench models or furnished with legs. Precision made throughout.

WYSONG and MILES Co.

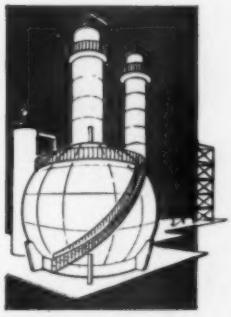
623 FULTON STREET

GREENSBORO, N. C.

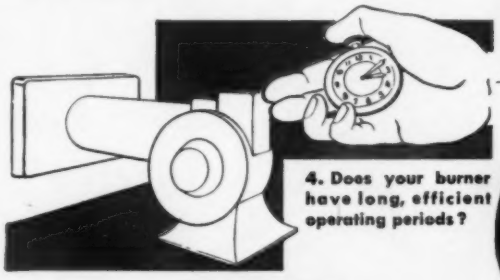
TRY THIS 3 MINUTE QUIZ ON ANY OIL BURNER USER

1. Did your oil burner operate last year without nozzle cleaning or replacement?

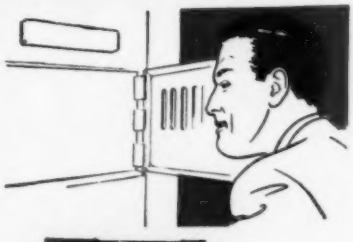
2. Is your present burner nozzle sized exactly to your heating load?



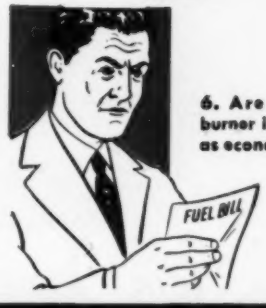
3. Will your burner operate on "hard-cracked" oil?



4. Does your burner have long, efficient operating periods?



5. Is the inside of your boiler or furnace clean and free of soot?



6. Are you sure your oil burner is heating your home as economically as possible?

IF THE ANSWER IS "NO" TO ANY QUESTION YOU'VE GOT A PROSPECT —AND A SALE!

The Winkler LP* licks 'em—all six reasons why owners are dissatisfied with their oil burners. This sensational advance in oil burner design slashes oil consumption . . . cuts service costs . . . introduces performance you have to see to believe!

Four great Winkler design features produce new standards in oil heating economy. They are—

The exclusive Winkler Fuel Meter. Unfailingly measures out the same amount of oil, regardless of viscosity. Assures greater combustion efficiency—greater economy—because of constant fuel-air ratio.

The exclusive Winkler Fuel Aerator. A "Rollator" type pump which intimately mixes exact amounts of air and oil and delivers this gaseous mixture at *low pressure* to the nozzle. A fundamental feature which contributes to Winkler LP* operating economy.

The exclusive Winkler Flame Controller. To distribute secondary air properly for different burning capacities, the Flame Controller can be moved forward or backward, developing the air pattern to exactly suit the capacity of the Fuel Meter. This mixing and turbulence causes every particle of oil to burn *quietly* and *completely!*

The exclusive Winkler Turbo Nozzle. The opening is as much as 30 times larger than that of a high pressure nozzle. Dirt or oil carbonization do not obstruct it, nor does a change in oil viscosity affect the flow rate. This feature alone saves service headaches—ends fuel waste due to oversizing.

For immediate profits start now to sell Winkler LP* Burners. Write today for information.

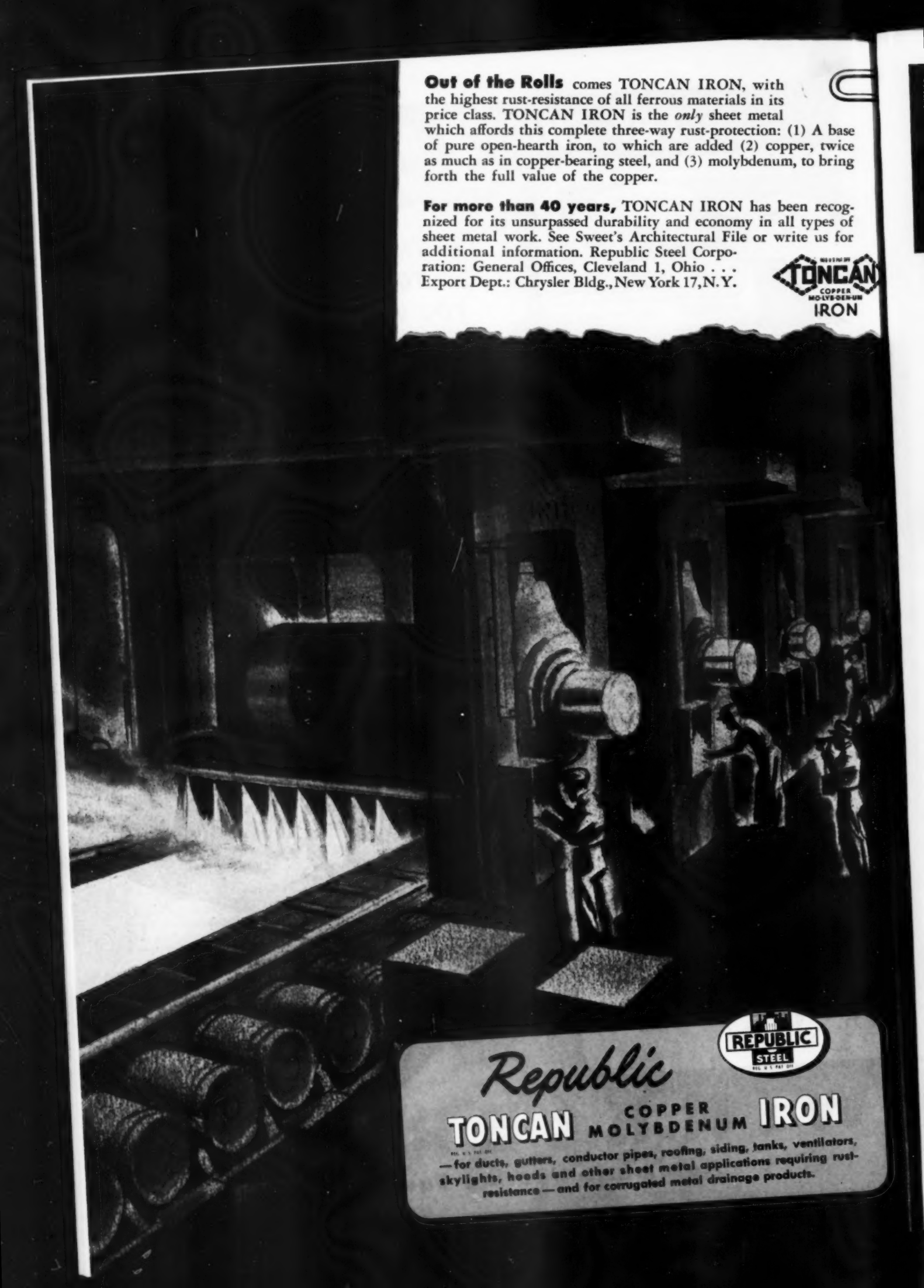
THE WINKLER LP* OIL BURNER

*LOW PRESSURE

WINKLER

U. S. MACHINE CORPORATION
DEPT. O-A6
LEBANON, INDIANA

Automatic Heating Equipment


Out of the Rolls comes TONCAN IRON, with the highest rust-resistance of all ferrous materials in its price class. TONCAN IRON is the *only* sheet metal which affords this complete three-way rust-protection: (1) A base of pure open-hearth iron, to which are added (2) copper, twice as much as in copper-bearing steel, and (3) molybdenum, to bring forth the full value of the copper.
For more than 40 years, TONCAN IRON has been recognized for its unsurpassed durability and economy in all types of sheet metal work. See Sweet's Architectural File or write us for additional information. Republic Steel Corporation: General Offices, Cleveland 1, Ohio . . . Export Dept.: Chrysler Bldg., New York 17, N. Y.
TONCAN
COPPER MOLYBDENUM
IRON
REPUBLIC STEEL
Republic
TONCAN COPPER MOLYBDENUM IRON
—for ducts, gutters, conductor pipes, roofing, siding, tanks, ventilators, skylights, hoods and other sheet metal applications requiring rust-resistance—and for corrugated metal drainage products.

"It's the VICTOR LINE for '49!"

VICTOR

OIL FURNACES FOR EVERY JOB

THE HI-BOY

The 11 VICTOROIL models let you meet competition with a big, confident smile! *With* capacities from 70,000 to 500,000 B.T.U.... *with* Victor Heat Radiating FINS ... *with* efficient gun-type burners designed for present-day No. 3 oil ... *with* all the fast-selling, exclusive VICTOR engineering features, rugged construction, ease of installation, and permanent user satisfaction.

THE "R" SERIES VICTOR OIL

ALL WITH HEAT RADIATING -FINS

THE HEAVY DUTY OIL - GAS or COAL

11 MODELS SET YOU UP TO HANDLE ANY SIZE JOB ...

THE "26" SERIES VICTOR OIL

Write Today!

... Investigate VICTOR! New plant addition has increased our capacity. New VICTOR accounts are being added FAST. Write us about the complete VICTOR Line for coal, gas and oil... you'll make more money in '49.

COAL • GAS • OIL FURNACES • OIL BURNERS • STOKERS • BLOWERS • ACCESSORIES

HALL-NEAL FURNACE CO.

VICTOR *Quality Furnaces Since 1890*

1322-1332 N. CAPITOL AVENUE • INDIANAPOLIS 7, INDIANA

"We have found Penn's Selling Policy is as Fair to Jobbers and Dealers as Their Products and Service are Tops"

That's the way E. J. Connor, President of Connor Co., heating jobbers, sums up his experience promoting and selling Penn controls. For years Mr. Connor has seen the Penn Tem-Clock and the Penn Thermostat pay off with the even performance and economy that count with home owners.

Like many other heating men, Mr. Connor knows that for 15 years Penn Thermostats, with Penn-developed heat anticipation, have consistently held temperatures within one-half degree of the selected level. And he also knows that, without any fancy language, this means real home heating comfort *without* "cold 70."

Your customers will appreciate this extra comfort. Try Penn. You, too, will like the simple two-wire installation, the rugged snap-acting contacts and all-round reliability of Penn's complete heating control line. **Penn Electric Switch Co., Goshen, Indiana.** Export Division: 13 East 40th Street, New York 16, U. S. A. In Canada: Penn Controls Ltd., Toronto, Ontario.

E. J. Connor, President, Connor Co., Peoria, Illinois

Here's What Penn Heat Anticipation Does . . .

- **Holds the temperature within one-half degree of selected level.**
- **Avoids "cold 70"; ends discomfort of "zig zag" heating.**
- **Automatically compensates for outside weather conditions.**
- **Provides more frequent, short burner operations instead of longer runs and standby periods, assuring even flow of warmth for greater comfort and fuel economy.**

It "hugs" the selected level for closer temperature control

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS RANGES

THERE'S *NEW BUSINESS* IN THE BASEMENTS ALL OVER TOWN!

YOU can get it...with the

UTILITY

ALL-YEAR CONDITIONER

(BLOWER-FILTER PACKAGE)

PRICED TO PRODUCE BUSINESS

You make your regular profit, though these are the lowest-priced blower-filter units on the market. They're priced to win a big slice of NEW business for you, beat out competition, and turn prospects into sales. The big value of top quality at a new low price will make a friend with every sale.

DESIGNED AND MANUFACTURED ENTIRELY BY "UTILITY"

Count up the gravity warm air systems around town! Plenty of those home owners are live prospects for better heating and fuel savings. That's what you can give them—through conversion to a forced-air system with a *Utility* All-Year Conditioner. It's *extra* money, *extra* business . . . that you can get from *your* old customers, *and* your competitor's old customers.

The *Utility* All-Year Conditioner is built to make friends for you. A dynamically-balanced, high performance *Utility*-built blower, motor, Fiberglas filters, and variable pitch pulley, are enclosed in a heavy steel cabinet. You can install it quickly, easily. With three models providing a CFM rating range of 700 to 2600, you can take any job.

For prices, catalog sheet, and complete details on how we help you sell, send the coupon NOW.

Be Headquarters for

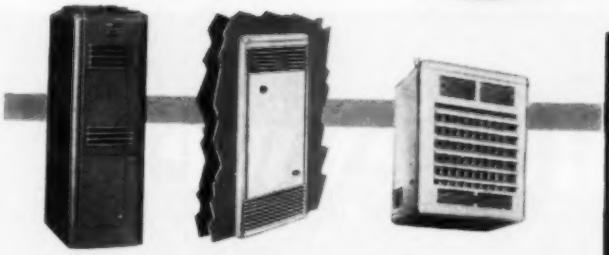
with the **UTILITY** *Line*

UTILITY
appliance corp.

4857 S. Alameda St., Los Angeles 11, Calif.

DIVISIONS

Gaffers & Sattler • *Occidental* STOVE CO.



FORCED AIR FURNACES | **WALL HEATERS** SINGLE AND DUAL | **UNIT HEATERS** SUSPENDED TYPE

Get the whole profit picture!

Please send complete information on your All-Year Conditioner, how you help us sell, and the *Utility* dealership arrangement.

NAME _____

ADDRESS _____

CITY _____ ZONE STATE

Evaporative Cooler Control.....

Honeywell Combination Unit Automatically Controls Temperature and Humidity

HERE IN ONE single unit is a Honeywell Temperature and Humidity Control that will greatly improve performance on all evaporative cooler installations.

This combination unit consists of a thermostat which operates both the fan and the water system, and a humidity controller which guards against excessive moisture in the air. When the humidity approaches the setting of the controls, the water supply system automatically shuts down, but the fan continues operation as long as the thermostat calls for cooling.

The MD 4712 Temperature Humidity Combination Unit is easy to install and can be operated manually, as well as completely automatically. The controls making up this combination unit are also available separately if required.

If yours is a market having warm, dry seasons, you will find this Evaporative Cooler Combination Control a source of big profits. Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Leaside, Toronto 17, Ontario.

CHECK THESE 10 IMPORTANT FEATURES

- Maximum operating efficiency from your evaporative cooler.
- Eliminates excessive humidification.
- Full manual control with five switching positions. Permits use of cooler for ventilation during all seasons.
- Controls directly motors up to ¾ horsepower.
- Attractive case for surface mounting; adapter plate available for flush mounting on wall.
- Controls and switches all internally connected—making a neat installation in one convenient location.
- Just *one* unit to hook up . . . saving time and wiring cost.
- Customers recognize and accept Honeywell controls as a standard of dependable quality.
- Honeywell branch offices in most principal cities, for prompt service.
- Carries Honeywell's regular *One Year Guarantee.*

MINNEAPOLIS
Honeywell
CONTROL SYSTEMS

73 BRANCHES FROM COAST TO COAST WITH SUBSIDIARY COMPANIES IN TORONTO • LONDON • STOCKHOLM • AMSTERDAM • BRUSSELS • ZURICH • MEXICO CITY

Headquarters for...

Guaranteed Heating Performance

that's YOU—with the UTILITY line

Here's a powerful sales tool that makes you stand head and shoulders above the crowd of heating dealers and contractors shouting the same old story. *"Headquarters for Guaranteed Heating Performance"* brands YOU as an expert heating counselor who combines know-how and UTILITY equipment for heating satisfaction. To put this idea over *permanently* —and to produce *immediate* business— *Utility* gives you a powerful advertising and sales program.

With the *Utility* line you have the units to get *both* residential and commerical jobs...with BTU capacities to fit any size job. Top quality and efficiency have been proved in the quarter-century of *Utility* production.

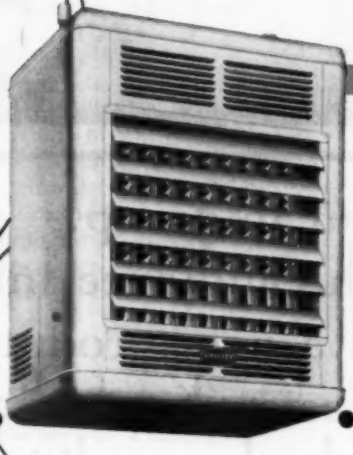
Get the whole story on this unbeatable combination of customer satisfaction and sales success for you.

Forced Air FURNACES

Smooth modern design. Compact, for small space installation. Fully automatic. *Utility*-built blower and burner. 4 sizes—BTU range, 75,000 to 150,000.

Suspended UNIT HEATERS

Completely self-contained. Quiet—slow speed, resilient base motor on streamline mounts. Individual burner for each element section prevents flame impingement. 4 sizes—BTU range, 60,000 to 225,000.



UTILITY
appliance corp.

4855 S. Alameda St., Los Angeles 11, Calif.

DIVISIONS

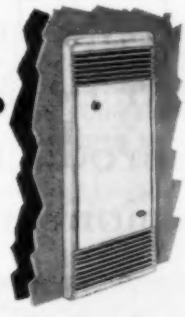
Gaffers & Sattler • *Occidental* STOVE CO.

COMPLETE RANGE OF SIZES ★ PRICED TO SELL AGAINST TODAY'S COMPETITION

UTILITY

ALL-YEAR CONDITIONER
(Blower-Filter Package)

Dynamically balanced, high performance *Utility*-built blower, Fiberglas filters, variable pitch pulley, heavy steel cabinet. CFM ratings from 700 to 2600.



Single and Dual WALL HEATERS

For every type of single and multiple-story structure. Pre-assembled with plaster guides and header for installing in any 4" wall without furring. 3 sizes—BTU range, 25,000 to 50,000.

Master Kraft

REG. U. S. PAT. OFF.

is about to make an addition to its distinguished line of heating equipment

Yes, the curtain is about to go up!
The house lights dim, the audience hushes, the footlights come up, and a new product is soon to be added to the Master Kraft line . . . a product in keeping with the tradition of the pioneers in oil heating equipment.

HARVEY-WHIPPLE, INC.

A PIONEER IN OIL HEATING FOR 26 YEARS

SPRINGFIELD 1, - MASS.

LOOK AT THIS PRESS

It's designed to provide industry with low-cost, high production units that are highly flexible in design and operation . . . relieving heavier presses of short runs and lighter work. Presses are practically fool-proof in operation. Frame is extremely rugged. Fingertip controls are conveniently located at hand level. Available for immediate delivery, in standard width (between uprights) of 24″—31″—36″—42″ respectively. Available in special width up to 72″ at small additional cost. Movable bed plates. Pumping unit has by-pass relief valve which can be set at any pressure up to press capacity. Presses available for either vertical or horizontal operation. *All Standard* presses equipped with 2-speed built-in hand pumps for more sensitive and versatile operation.

READ THESE "SPECS":

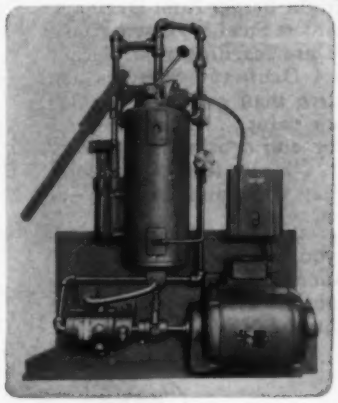
CYLINDERS: *Standard Models* furnished with 6" bore, 7½" stroke—spring return type; also 5" bore, 7½" stroke—spring return type. Above presses are *standard.* Following can be furnished at additional cost: Double Acting, 6" bore, 7" stroke; 6" bore, 11" stroke; 5" bore, 7" stroke; 5" bore, 11" stroke. Special long stroke cylinders also available, up to 48" in length, for incorporation in suitable press frames of our make.

PUMPING UNITS: These units can be supplied in various volumes and pressures, in a total of 13 combinations.

Presses include V blocks, Gauge, Motor Controls, Pressure Regulator, etc., complete and ready to attach to electrical source.

CHECK THESE USES:

There are so many everyday production uses for these versatile KRW Hydraulic Presses that we have lost count. Here are a few of the more obvious . . . blanking, forming, bending, broaching, straightening, stamping, embossing, numbering, upsetting, laminating, pressing and hot or cold forging. KRW Engineers are daily developing other uses. If you have only a vague idea of how these presses might be used in your plant, let us have it in a rough form. We'll do the rest.



MODERNIZE AND MOTORIZE YOUR PRESENT KRW PRESS with one of these compact motor drive units. They come complete ready to connect to your press. Require very little extra floor space. Write for conversion unit prices, giving the capacity and serial number of your press.

BEAT THESE PRICES*:

Depending upon capacity of pumping equipment, prices of Standard model motor driven hydraulic presses are as follows, F. O. B. Factory: 25-ton press from $727.00 to $992.00. 50-ton press from $806.00 to $1058.00. 60-ton press from $1070.50 to $1135.00. 75-ton press from $1198.00 to $1258.00. All motors in the above units are 220/440 volt, 3 phase, 60 cycle. Any change in motor specifications is extra. **Subject to change without notice.*

MAIL THIS COUPON

It will bring you all the money-saving facts about these low cost, high production hydraulic presses. Now is the time to get ready for the highly competitive days ahead.

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

Please send me complete information on KRW Motor Driven Presses as follows:

☐ 25-ton ☐ 50-ton ☐ 60-ton ☐ 75-ton presses

☐ motor drive conversion unit ☐ Press Cap.

Serial No. .....

Name .....

Address .....

City and Zone ..... *State* .....

56

K·R·WILSON

215 MAIN ST. · BUFFALO 3, N. Y.

Bright Opportunity for Sheet Metal Profits...

WITH BERGER ROOF DRAINAGE PRODUCTS OF *Enduro* * STAINLESS STEEL

Demand for light, weathertight Berger Roof Drainage Products of ENDURO Stainless Steel is growing fast. Home owners everywhere are learning that Berger ENDURO Stainless Steel Drainage Systems are stronger and more attractive than ordinary systems . . . do not bleed or discolor paint . . . resist rust and corrosion . . . resist abrasion and denting . . . require little or no maintenance . . . cost less in the long run. These are features they want and will buy—at a nice profit to you.

You don't have to change your methods or equipment one bit to give your customers all these lifetime advantages of ENDURO Stainless Steel. Because of its high strength-to-weight ratio, ENDURO is used in thinner, lighter sections that are easy to handle and hang. 28-gauge ENDURO works as easily as familiar 26-gauge galvanized steel, with the same tools and equipment. It's easy to solder, too. Use 50-50 or commercial stainless steel solders with a large iron heated slightly more than for ordinary jobs. Immediately after soldering, wash off all acid and flux with a 5% to 10% solution of washing soda with water. That's all there is to it.

Check with your jobber, soon. You'll find his stocks of ready-to-use Berger ENDURO Stainless Steel Roof Drainage Products are complete right down to the last accessory, fitting and nail. He also carries Berger Roof Drainage Products in galvanized steel and in copper.

Berger REPUBLIC STEEL

Manufacturing Division

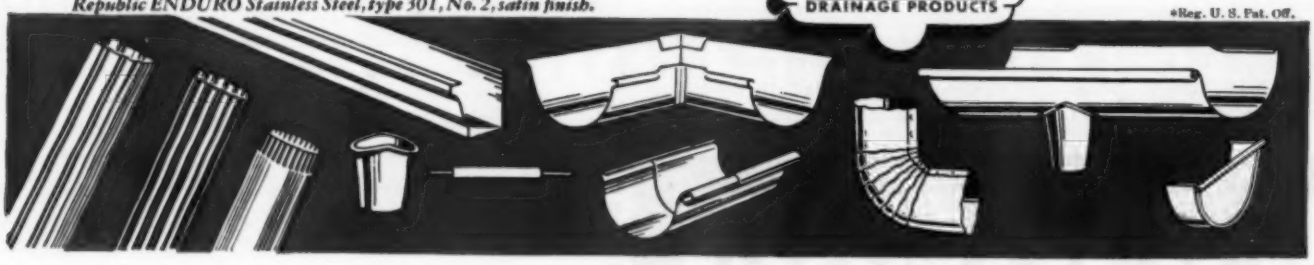
REPUBLIC STEEL CORPORATION • CANTON 5, OHIO

Warehouses in BOSTON, PHILADELPHIA and ST. LOUIS • Sales Offices in DETROIT, MICH., and INDIANAPOLIS, IND.

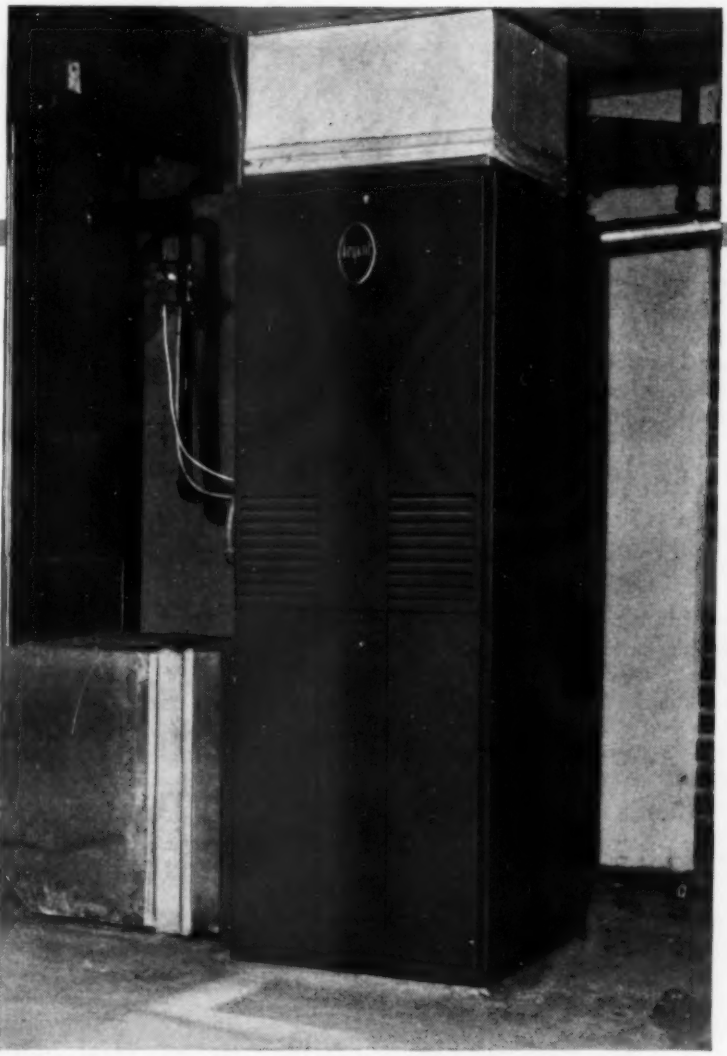
Berger Stainless Steel Roof Drainage Products include Snaptite Eaves Trough; "K" Gutter; Plain Round, Corrugated Round and Corrugated Square Conductor Pipe; plus a complete line of all necessary fittings. All are made of 28-gauge Republic ENDURO Stainless Steel, type 301, No. 2, satin finish.

BERGER STAINLESS STEEL ROOF DRAINAGE PRODUCTS

*Reg. U. S. Pat. Off.



"Space-Saver Supreme is the BRYANT Vertical Winter Air Conditioner"



says Paul Livoli,
Builder and Owner,
Fairfield Gardens,
Watertown, Mass.

"Bryant Automatic Heating has always been my favorite for home construction, and it has proved itself for economy and satisfaction in my housing developments. At Fairfield Gardens, we installed Bryant Model VS-304 Vertical Winter Air Conditioners because of these qualities and because they are wonderful space-savers."

In a single or multiple installation, the Bryant Model VS-304 Winter Air Conditioner provides the kind of fully-automatic, trouble-free operation that pays off all down the line . . . from sales appeal to economy to customer or tenant satisfaction. It's a long-lived space-saver that can be installed almost anywhere. The smallest of its six sizes (45,000 to 145,000 Btu per hour input) requires only slightly more than two square feet of floor space. The VS-304 is A.G.A. approved for all gases.

Ask your Bryant Distributor how this slim, efficient unit will fit into your sales plans.

Fairfield Gardens is the largest privately-owned rental project in New England. It consists of 26 buildings and a total of 308 garden-type family apartments and was built by Paul Livoli, one of New England's most extensive housing developers. Each of the 308 family units has a full basement, in which is installed a Bryant Model VS-304 Winter Air Conditioner such as the one shown above. This unit features the Bryant *Hevigage* 12-Gauge Steel Heat Exchanger (approximately three times the minimum thickness required by A.G.A.) and Bryant push-button ignition (which is available for city gases only). Heating Contractor for Fairfield Gardens was John B. Naylor Co., Watertown, Mass.

Let the pup be furnace man
. . . and water boy, too!

bryant
AUTOMATIC HEATING

BRYANT HEATER DIVISION
Affiliated Gas Equipment, Inc.
Cleveland, Ohio • Tyler, Texas

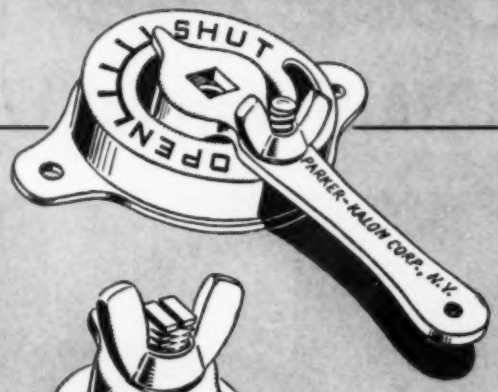
THE MOST COMPLETE LINE OF GAS HEATING EQUIPMENT IN THE NATION

PARKER-KALON® DAMPER CONTROLS

Easy to install . . . a credit to your shop!

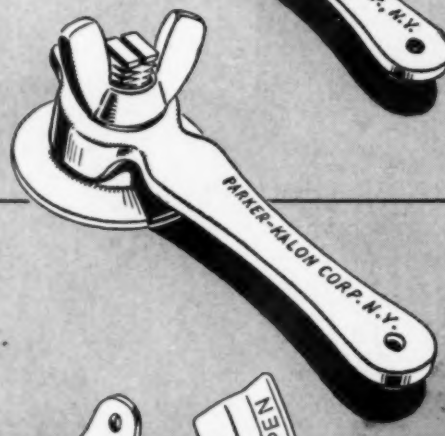
DIAL REGULATOR

Many heating contractors call this damper regulator "the best buy on the market". Unique Parker-Kalon frame prevents air leakage; eccentricity of hole in frame with opening in lever binds the bearing and prevents damper rattles; lever rotates on frame hub, assuring free and easy operation of regulator.



JIFFY REGULATOR

Simplest of all damper regulators. Developed to meet the demand for a low-cost device for domestic air conditioning and furnace installations. Installed in a jiffy — does not even have to be attached to duct. Simply slip frame and lever on threaded bearing, turn on wing nut and tighten.



UNXLD QUADRANT

Recognized as the "standard" for manually operated damper controls. Leading architects specify it, heating and ventilating engineers endorse it, and sheet metal contractors everywhere prefer to use it. Easily and quickly attached to round or flat surfaces, it makes a neat installation, provides positive control of the damper.

GET THIS *Folder*

Specify P-K Damper Controls on your next job. A cinch to install, they can help you build good will and profits. Your nearby Parker-Kalon Distributor will be glad to take care of your order. Send for folder describing the complete P-K line of damper controls. See why you can "put 'em in and forget 'em". Write Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

AVAILABLE THROUGH ACCREDITED DISTRIBUTORS

P-K® *The Original*

PARKER-KALON SELF-TAPPING SCREWS

FOR EVERY METAL AND PLASTIC ASSEMBLY

P-K Also Makes
Cold-forged

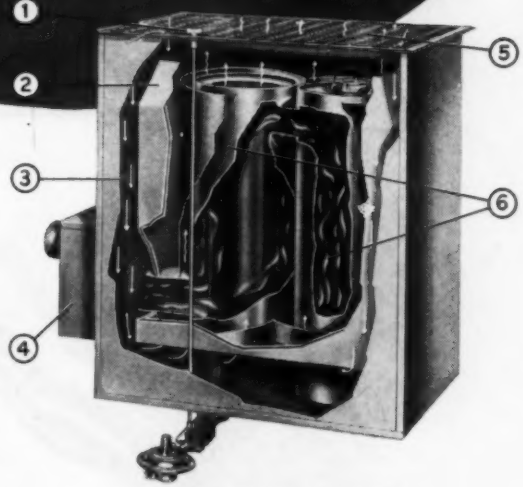
OTHER P-K PRODUCTS: Cold-Forged Socket Screws, Wing Nuts, Thumb Screws • Hardened Screwnails and Masonry Nails • Shur-Grip File and Solder Iron Handles • Metal Punches • Damper Regulators and Accessories

AMERICAN-Standard

First in heating . . . first in plumbing

The Saginaw Floor Furnace

means *extra* business for you



A MODERN GAS FIRED, LOW COST UNIT

for small homes or stores

with or without basements

■ Plenty of families right in your own community are in the market for a quality floor furnace like this. Available in four popular sizes, the Saginaw is ideal for small homes with or without basements, and stores and similar structures. Moreover, it is within reach of the smallest budget—both as to initial investment and operating cost. Shipped completely assembled for easy installation, the Saginaw burns manufactured, natural, mixed or liquefied petroleum gas. Complies with National Safety requirements approved by American Gas Association. And, like other American-Standard products, the Saginaw can be sold for modernization on a convenient time payment plan. For details, contact your Wholesale Distributor. **American Radiator & Standard Sanitary Corporation,** P. O. Box 1226, Pittsburgh 30, Pa.

CHECK THESE FEATURES

1. CONVENIENT MANUAL CONTROL — removable key easily operates main burner and pilot valve through register face. Automatic controls available at slight extra cost.

2. SEPARATION CASING—prevents overheating of return air passage, thus improving air circulation and reducing outer casing temperature. Easily removable, thus making inside of furnace accessible for cleaning.

3. RETURN AIR PASSAGE — correctly proportioned to insure unrestricted flow of air from the floor through the unit.

4. DRAFT HOOD — expertly designed to provide proper draft control and protection of burner against down draft.

5. REGISTER — easily removable. Sturdily constructed of fabricated steel with enamel finish.

6. COMBUSTION CHAMBER AND RADIATOR — fabricated from heavy gauge steel with all seams welded for permanent tightness. Ample surface enables greatest amount of heat to be absorbed from flue gases before they enter chimney. Adequate height gives necessary thermal head for superior air circulation.

Here's the Ticket

here's the Line

— to better business in '49!

When you sell American-Standard products you get all the selling aids you need to bring in more business. Ask your Wholesale Distributor for details of this powerful new advertising and merchandising program.

Look for this American-Standard Heating Plumbing *Mark of Merit*

Serving home and industry

AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILER • ROSS HEATER • TONAWANDA IRON

DELCO PRODUCTS has been in the business of building appliance motors for a good many years. We've been in it long enough to know that latitude must be allowed for last-minute changes in customers' scheduling.

For Delco Products has a sound concept of service. Our experience has taught us to appreciate the manifold problems a manufacturer runs up against. All our resources are organized to help meet them promptly and smoothly . . . to deliver on time.

It's this human, personal quality as well as our complete, modern engineering and manufacturing facilities that makes Delco Products a byword for the finest in appliance motors.

DELCO PRODUCTS DAYTON, OHIO

DELCO MOTORS

DELCO PRODUCTS

Division of General Motors Corporation, Dayton, Ohio

Sales Offices: CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HARTFORD, CONN.

QUALITY
ALL THE WAY THROUGH

WEIRITE — HOT-DIP AND ELECTROLYTIC TIN PLATE, TIN MILL BLACK PLATE AND SPECIAL COATED MANUFACTURING TERNES

WEIRZIN — ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

WEIRTON — HIGH-CARBON STRIP COLD-ROLLED SPRING STEEL

WEIRALEAD — LEAD ALLOY COATED SHEETS AND LONG TERNE SHEETS

WEIRCOLOY — GALVANIZED SHEETS

N-A-X — HIGH-TENSILE LOW-ALLOY STEELS

Lacquered and Coated Products • Tie Plates • Structurals • Bars • Piling
Hot-Rolled Sheets and Strip • Cold-Rolled Sheets and Strip • Angles

WEIRTON STEEL CO.

WEIRTON, W. VA. *Sales Offices in Principal Cities*
Division of NATIONAL STEEL CORPORATION *Executive Offices, Pittsburgh, Pa.*

WEIRTON STEEL COMPANY

NATIONAL STEEL

NIAGARA

Presents America's Newest and Finest

16 GAGE FOOT SHEAR

Featuring

- Capacity greater than ever before
- Welded steel strength and rigidity
- Formed steel throughout
- Automatic holddown
- Heavy duty bronze ways
- Clean straight cuts
- Easy operation — lively action
- Portable
- 30, 36 and 42" cutting lengths

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.
DISTRICT OFFICES: NEW YORK, CLEVELAND, DETROIT

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SALL MOUNTAIN COMPANY

Asbestos

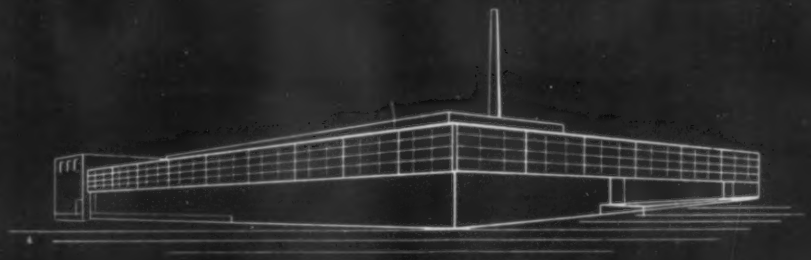
UTILITY SERVICE ECONOMY

SINCE the year 1886, when Sall Mountain Company was founded, this company has taken a leading position in manufacturing Asbestos Products and in the fitting of asbestos to an ever widening field of industrial uses.

The latest in advance equipment is of course, important, but most important is the long years of Sal-Mo experience in solving problems involving the use of Asbestos.

SALL MOUNTAIN COMPANY

ANdover 3-2414 • 176 W. Adams St. • Chicago 3



At our mills we have the latest improved and highly specialized equipment and machinery for processing Asbestos and Asbestos Products.

TWO LOW-PRICED UNITS FOR LOW-PRICED HOMES

Built for Easy Sales- Big Profits!

The new KO·Z·AIRE 90's and 115's

Compact! Ideal for Multiple Housing!

FULLY AUTOMATIC! GAS FIRED! Watch your profits go up and up as the demand for economy grows and grows! These conditioning units offer clean, year-round comfort in true KO·Z·AIRE style, and new, low prices to help you cash in on the rising demand for lower building costs.

SHIPPED READY TO INSTALL! All units are fully assembled and wired. Model "90" is rated at 90,000 Btu. input, and model "115" at 115,000. Packaged for efficiency! Competitively priced! Watch for important news about other KO·Z·AIRE conditioning units.

MAIL COUPON NOW FOR FULL FACTS!

Jones & Brown, Inc.
439 Sixth Ave., Pittsburgh 19, Pa.

Please send me the full story on the new, low-priced, fast-selling KO·Z·AIRE units.

Name .....

Address .....

City ..... State .....

A

BUILDING PRODUCTS J&B FOR BUILDING PROFITS

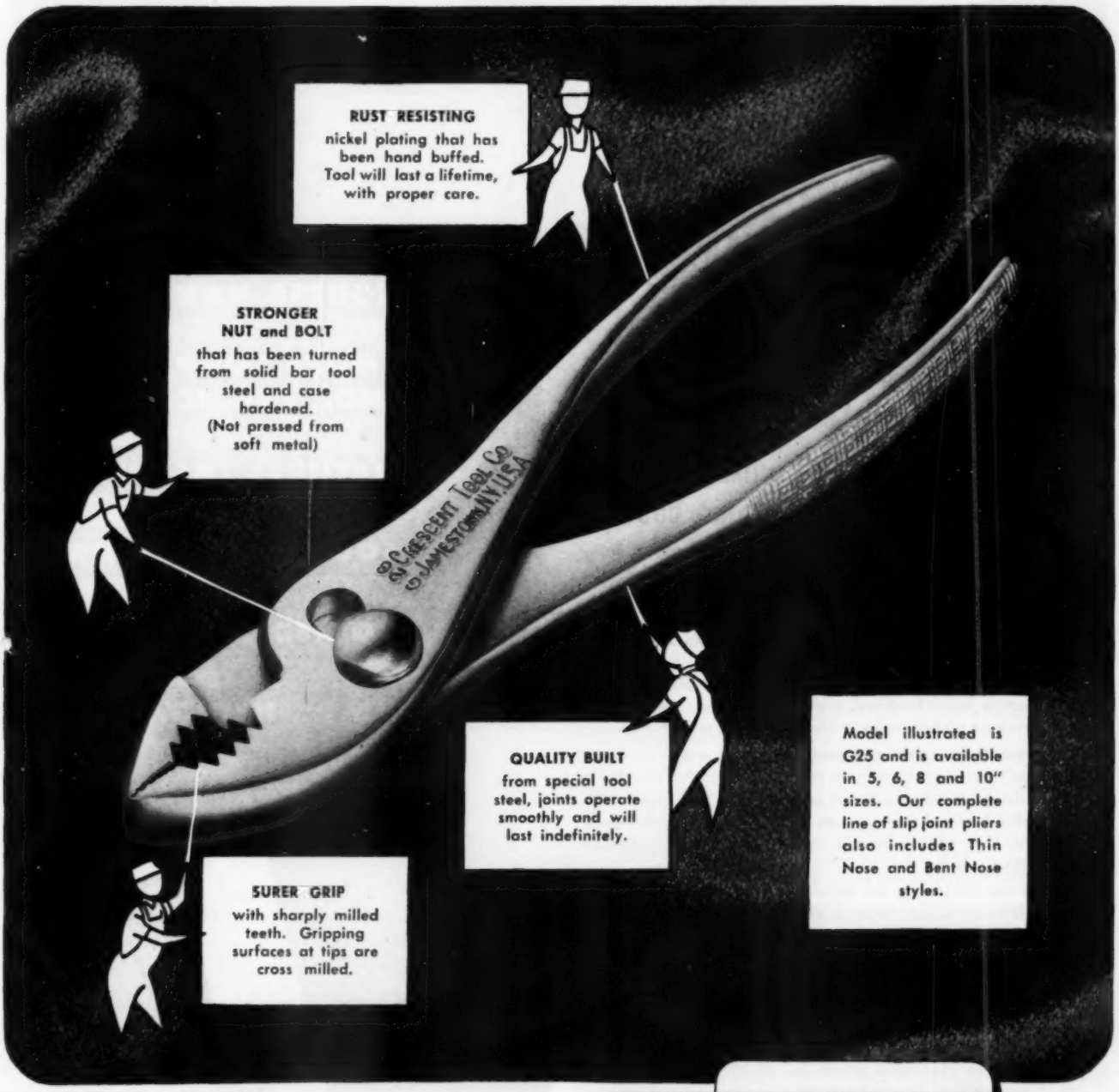
KO·Z·AIRE

JONES & BROWN, INC.

439 SIXTH AVENUE · PITTSBURGH 19, PA.

CRAFTSMEN RECOGNIZE QUALITY *by these fine features in*

SLIP-JOINT PLIERS


RUST RESISTING
nickel plating that has been hand buffed. Tool will last a lifetime, with proper care.
STRONGER NUT and BOLT
that has been turned from solid bar tool steel and case hardened. (Not pressed from soft metal)
CRESCENT TOOL CO
JAMESTOWN N.Y. U.S.A.
QUALITY BUILT
from special tool steel, joints operate smoothly and will last indefinitely.
Model illustrated is G25 and is available in 5, 6, 8 and 10" sizes. Our complete line of slip joint pliers also includes Thin Nose and Bent Nose styles.
SURER GRIP
with sharply milled teeth. Gripping surfaces at tips are cross milled.

EVERYBODY RECOGNIZES QUALITY *by this Trade-mark*

CRESCENT TOOLS

Sign of the Artisan
Symbol of Excellence

"Crescent" is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by

CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

HIGH QUALITY FEATURES FOR LOW COST HOMES

LIGHTER HANDLING

MORE COMPLETE SHOP FABRICATION

NATURAL INSULATION

SOUND DEADENING

NO RED-RUST

NO PAINTING

REYNOLDS *LIFETIME* ALUMINUM DUCTWORK FITS TODAY'S REDUCED BUILDING BUDGET

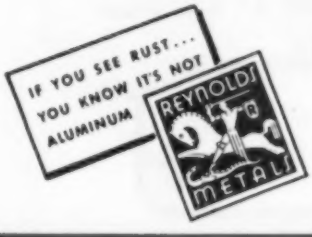
The aluminum ductwork in this low-cost Wilmette, Illinois, home was installed by Wagner Sheet Metal Co. In describing ducts of Reynolds *Lifetime* Aluminum, Alex Friebus, President of the company, says, "... it's the source of many customer compliments." Low-cost homes can afford this high quality feature today because aluminum, with all its many advantages, has a competitive price. Ductwork in aluminum is smart looking, and Reynolds duct sheet offers the fabricator real economies obtained with no other metal.

You get three times the metal to work with for every pound of Reynolds Aluminum you buy. It's ⅓ the weight of conventional metals, and that accounts for the speed with which this better ductwork can be handled, fabricated and installed. One big advantage is the extra amount of shop fabrication you can do.

Costs are cut too by the elimination of paint and insulation. There's no rust hazard, so basement dampness and moisture collection with air conditioning is never a threat.

With today's building budgets cut to the bone, look at Reynolds Aluminum for ductwork from a profit standpoint. Total all the advantages, add the superior customer appeal, and you'll use this better metal. Call the Reynolds Distributor or Sales Office nearest you. They're listed under "Aluminum" in your classified telephone directory. Or write to Reynolds Metals Company, Aluminum Division, 2542 South Third Street, Louisville 1, Kentucky.

FREE—*Send for a copy of "Heating, Ventilating and Air Conditioning." It gives complete details with illustrations.*



REYNOLDS METALS COMPANY, Aluminum Division, Louisville 1, Ky.

REYNOLDS *Lifetime* ALUMINUM

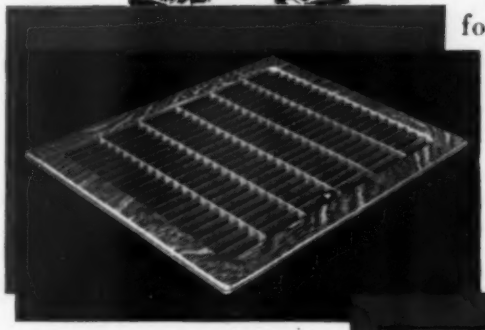
THE COMPLETE ALUMINUM SERVICE FROM BASE METAL TO FINISHED PARTS

WHY are more H&C registers used THAN ANY OTHER MAKE?

Take the construction of the H & C No. 210 Floor Register, for instance —

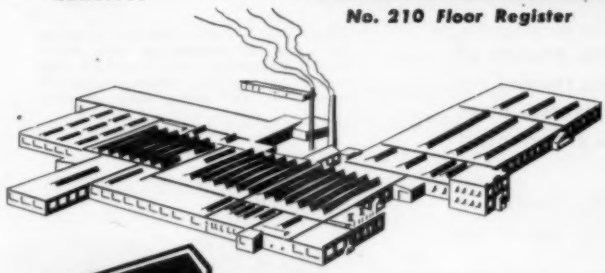
1. **ONE-PIECE MARGIN . . . no mitered corners . . . neat and trim.**
2. **COMPRESSED MESH . . . The entire fretwork is squeezed under tremendous pressure, resulting in greater strength.**
3. **EACH AND EVERY MESH MEMBER IS FIRMLY LOCKED INTO THE MARGIN.**
4. **NEW MULTI-SHUTTER VALVE RUNNING SHORT WAY OF THE REGISTER . . . "Smooth as silk" in operation . . . Closes tightly.**
5. **EASILY REMOVABLE FACE . . . Just four screws to remove.**
6. **CLOSE MESH . . . Heel-proof . . . Duct concealing.**
7. **AMPLE FREE AREA . . . Over 75% (average).**
8. **ADEQUATE CLEARANCE FOR QUICK AND EASY INSTALLATIONS IN STANDARD OPENING OR FLOOR BOX.**
9. **BAKED-ON FINISH, LONG-WEARING SUPERIOR QUALITY.**

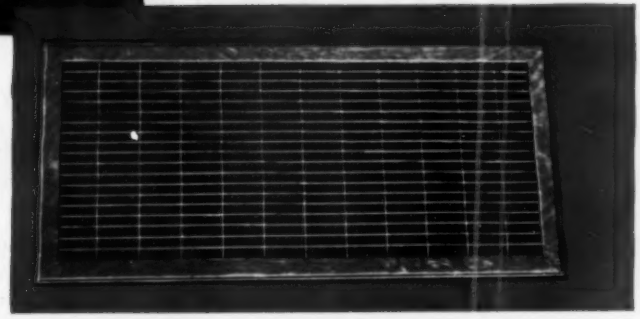
Because: they are EXCEPTIONALLY well made . . . Designed and finished for EXCEPTIONALLY good appearance and perfect functioning . . . . Individually packaged for maximum convenience and perfect protection to the point of installation . . . Because progressive installers know that what is best for their customers is best for themselves . . . And that by standardizing on this one line which offers an ideal register for every type of installation, they can solve all their register problems to best advantage, once and for all.



No. 210 Floor Register

The No. 265 Return Air Face, matches the No. 210 in mesh and general construction.



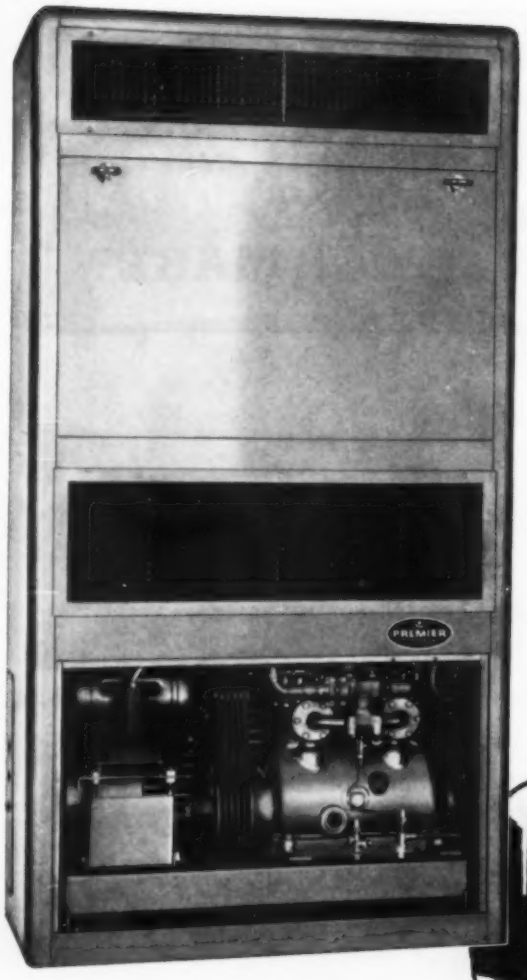


HART & COOLEY MANUFACTURING CO. Holland, Mich.

WORLD'S LARGEST MANUFACTURERS OF

REGISTERS, GRILLES AND FURNACE ACCESSORIES

IN CANADA: HART & COOLEY MANUFACTURING CO., FORT ERIE, N. ONTARIO



PREMIER Package Cooling Systems — completely self-contained, with heavy duty condensing unit and quiet, large capacity blower. Cools, dehumidifies, filters. Handsome insulated cabinet.

Announcing

PREMIER COOLING EQUIPMENT

A Great New Line and a Great New Sales Opportunity for You!

FULL RANGE OF COMPRESSOR TYPE AIR COOLERS

Compressor type package systems for central installation with duct-work. Completely assembled and tested at factory. Wide range of capacities. For heavy duty service.

Now PREMIER helps the Independent Dealer to maintain volume sales and handsome profits straight through the warm weather months!

This complete new PREMIER line of Cooling Equipment enables you to sell a broad new market, right in your own locality — a prosperous, active market, where sales run to substantial size and profits are in proportion.

In the cooling field your business is not limited by the amount of installation work you can do, since many cooling units require no installation. And, because cooling is only heating in reverse, these cooling jobs are simple and easy for any dealer who is experienced in heating work.

Find out how PREMIER cooperation and engineering assistance will pave the way to success for you in cooling. Write today for literature, prices and engineering data.

Also a Full Line of "COLD WATER" Cooling Equipment

PREMIER FURNACE COMPANY

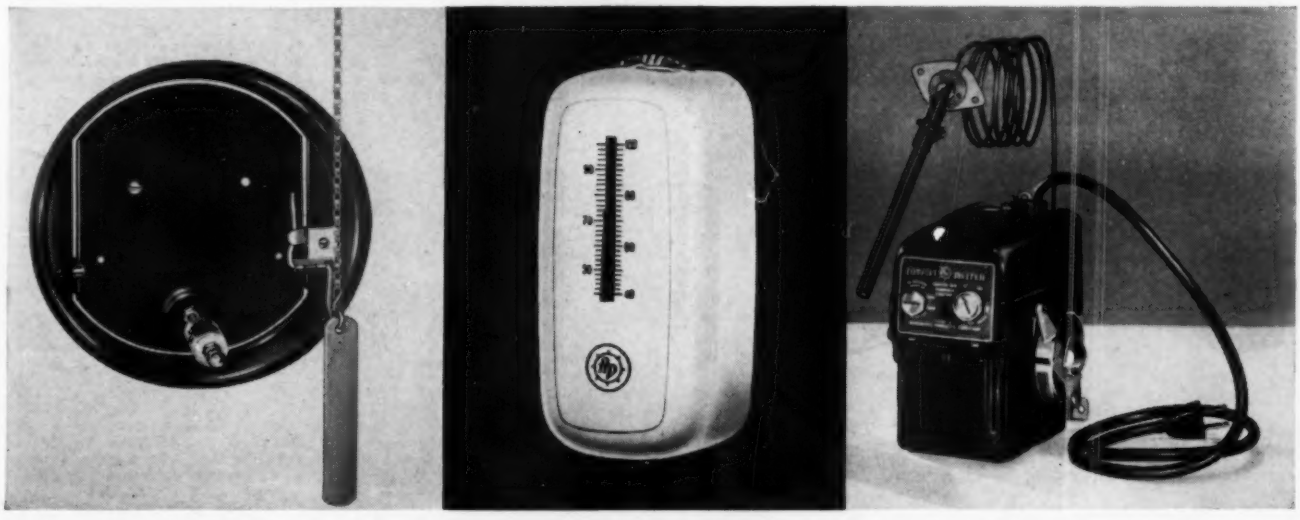
Heating and Air Conditioning Products

30TH YEAR — SAME OWNERSHIP — SAME MANAGEMENT — SAME SALES POLICY

Dowagiac, Michigan

You Have the Answer
TO LOW-COST COAL HEAT
in the New A-P
COMFORT MASTER

It's an answer that pleases your customers . . . and it can make you a lot of money! Every time you make a service call where a manually controlled, coal-fired furnace is in use, talk up the A-P COMFORT MASTER. Quickly installed, DEPENDABLE in operation, it brings sheer comfort, greater fire protection, peace of mind and substantial coal savings. People want it . . . but you've got to let 'em know you have it.



Never before was all this possible in a set requiring only one simple electrical connection besides plugging in a line cord. Look . . .

- **HEAT ANTICIPATING THERMOSTAT** that "remembers" to turn off the heat before it's too late.
- **HYDRAULIC ACTION MOTOR** submerged in oil so it needs no further lubrication.
- **THERMO-BULB LIMIT CONTROL** for easy hook-up to warm air or hot water systems.
- **SAFETY FEATURE** to check damper if power fails.
- **STOKING SAFETY SWITCH** opens draft during coal loading, closes it when gases are burned off.
- **OUTDOOR TEMPERATURE ADJUSTMENT** — dial range, 100° to 350°.
- **"CHIMNEY-TROL,"** (Field Barocheck) draft control, makes furnaces and pipes last longer, ends fire danger of overheating, and cuts fuel costs 22½%!

When you consider that A-P COMFORT MASTER does a DEPENDABLE control job for your customers, you have a dependable reason for doing an outstanding merchandising job with it. Write for complete details about COMFORT MASTER.

Sure to Please... Sure to Sell!

AUTOMATIC PRODUCTS COMPANY

2452 NORTH THIRTY-SECOND STREET • MILWAUKEE 10, WISCONSIN

DEPENDABLE *Controls*

FOR HEATING • AIR CONDITIONING • REFRIGERATION

MONCRIEF'S *New 2 in 1 Units*

APPROVED FOR GAS ★ ★ ★ APPROVED FOR OIL

The same unit is used for Gas or Oil.
If Gas is the fuel selected, the Moncrief Gas Burner is installed . . .
If Oil is the fuel selected, the Moncrief Pressure Vaporizing Oil Burner is installed . . .

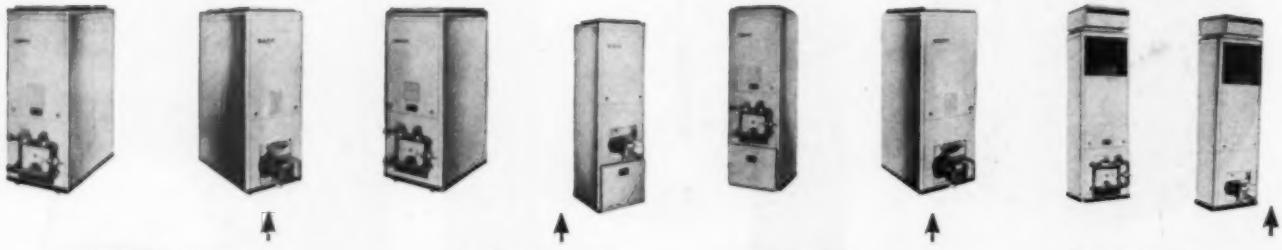
You can do a greater amount of business on a smaller inventory—because you do not have to keep in stock separate Gas Units and separate Oil Units. This 2 in 1 combination is available in Basement Air Conditioning Unit, Gravity Furnace, and Utility Air Conditioning Unit, and the Counter Flow Utility Unit with blower mounted in top of cabinet for floor panel heating.

Series GL-100
Gas Fired Air Conditioning Unit
100,000 Btu Input

Series GU-95
Gas Fired Utility Air Conditioning Unit. 95,000 Btu Input

Series GW-85
Gas Fired Gravity Furnace
85,000 Btu Input

Series GUC-95
Gas Fired, Counter Flow Air Conditioning Unit with Blower in top of Cabinet for floor panel heating
95,000 Btu Input

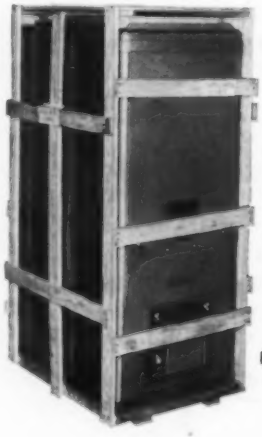


Series VL-65
Oil Fired Air Conditioning Unit
76,000 Btu Output

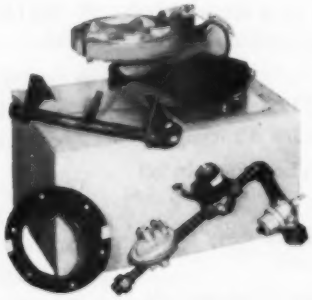
Series VU-75
Oil Fired Utility Air Conditioning Unit. 75,100 Btu Output

Series VW
Oil Fired Gravity Furnace
60,600 Btu at Register

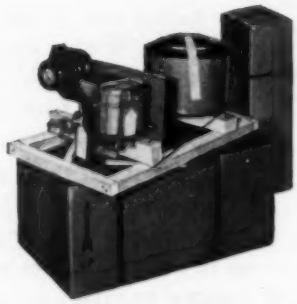
Series VUC-75
Oil Fired, Counter Flow Air Conditioning Unit with Blower in top of Cabinet for floor panel heating
75,100 Btu Output



Heating Unit crated for shipping



Carton with Gas Burner assembly - controls - all parts and fittings for a complete installation



Cartons with Pressure Vaporizing Oil Burner which is factory assembled and adjusted. All parts and fittings - all controls for a complete installation.

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1895 — FURNACE PIPE AND FITTINGS

PACKARD SUNLIGHT MOTORS

Built by fractional horsepower motor Specialists

Packard *specializes* exclusively in the manufacture of fractional horsepower motors. Our entire enlarged plant facilities . . . all of our engineering and manufacturing experience . . . are concentrated in this single field. Manufacturers of motor-driven appliances and equipment have long profited from this singleness of purpose. Packard Fractional Horsepower Motors are of outstandingly uniform quality . . . can be delivered in greater quantities in less time. For fast action on your fractional horsepower motor problem, specify Packard motors—engineered and built for lasting satisfaction.

Packard
REG. U. S. PAT. OFF.
TRADE MARK

Packard Electric Division, General Motors Corporation
Warren, Ohio

GM
GENERAL MOTORS

PACKARD MOTORS for

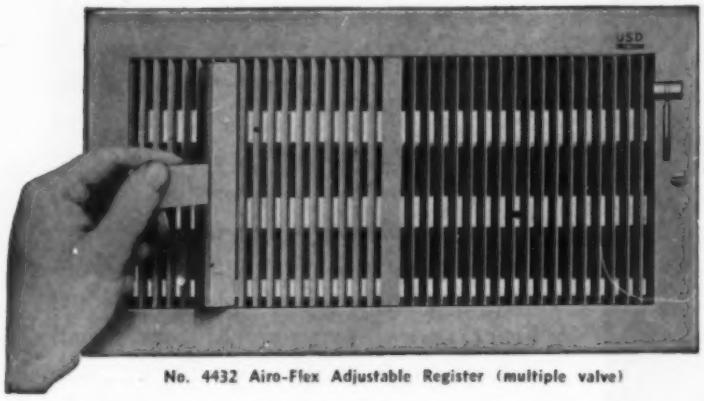
Compressors • Power-driven Bench Tools • Ironers • Milking Machines • Stokers • Milk Separators • Washing Machines • Furnace Blower • Water Pumps • Oil Burners • Ventilators and many other applications

ORS FOR THIRTY-TWO YEARS

The Economical Auer 4-WAY

AIRO-FLEX "4400" Series Registers

Adjustable for Right or Left also Up & Down Directional Flow

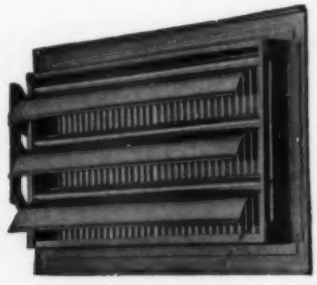


No. 4432 Airo-Flex Adjustable Register (multiple valve)

This Auer "4400" Series air conditioning register has proved a very popular number. Apparently many contractors are finding this multiple valve model economical enough to use on jobs where, previously, they would have installed single louvre registers. In the Airo-Flex "4400" you have a genuinely fine quality register, neatly turned out, smoothly operating, 4-way directional, yet moderately priced. The entire design and working mechanism have been kept as simple as possible.

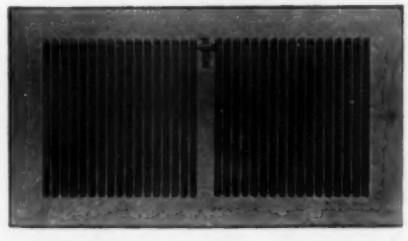
This Airo-Flex has horizontal multi-valve deflecting blades governing up-and-down flow. Setting of blades is shown by indicator on face. Sturdy vertical fins on face are also easily adjusted to desired right or left angles, with turning tool. This is an outstanding value in a 4-way register and can be used with pride on any job.

The same design face is available in the "4000" line, with single valve, for right or left flow, as shown below, and also in the "7000" series for up-or-down direction, with horizontal fins and single valve.



Back view of Airo-Flex No. 4432 Register

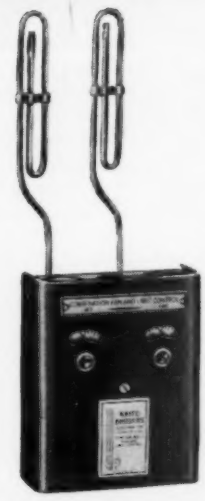
No. 4032



Auer makes a complete line of high grade registers for all your gravity or air conditioning needs. Auer Register Book (or special Catalog "G" on flat stamped metal Grilles) mailed on request.

THE AUER REGISTER CO., 3608 PAYNE AVENUE, CLEVELAND 14, OHIO

Auer REGISTERS
& GRILLES *for* AIR CONDITIONING & GRAVITY



Proved, Dependable, Sturdy

WHITE-RODGERS *Dual*

Hydraulic-Action

FAN AND LIMIT CONTROLS

assure you

QUICKER INSTALLATION and Better Satisfied Customers

Two controls mounted in a single case, each operating independently, but requiring only a single mounting.

Dials accurately calibrated in degrees Fahrenheit permit exact setting for each installation.

Tremendous power of Hydraulic-Action permits use of more-rugged switch not affected by vibration.

Because the flexible Hydraulic-Action elements can be bent to any angle, and off-level installation does not affect their accuracy, White-Rodgers Fan and Limit Controls can be installed in any position.

Accurate at *any* point in temperature range.

No temperature drift—factory calibration remains throughout life of the control.

High electrical ratings—handles most heavy-duty equipment without motor starters or relays.

WHITE-RODGERS

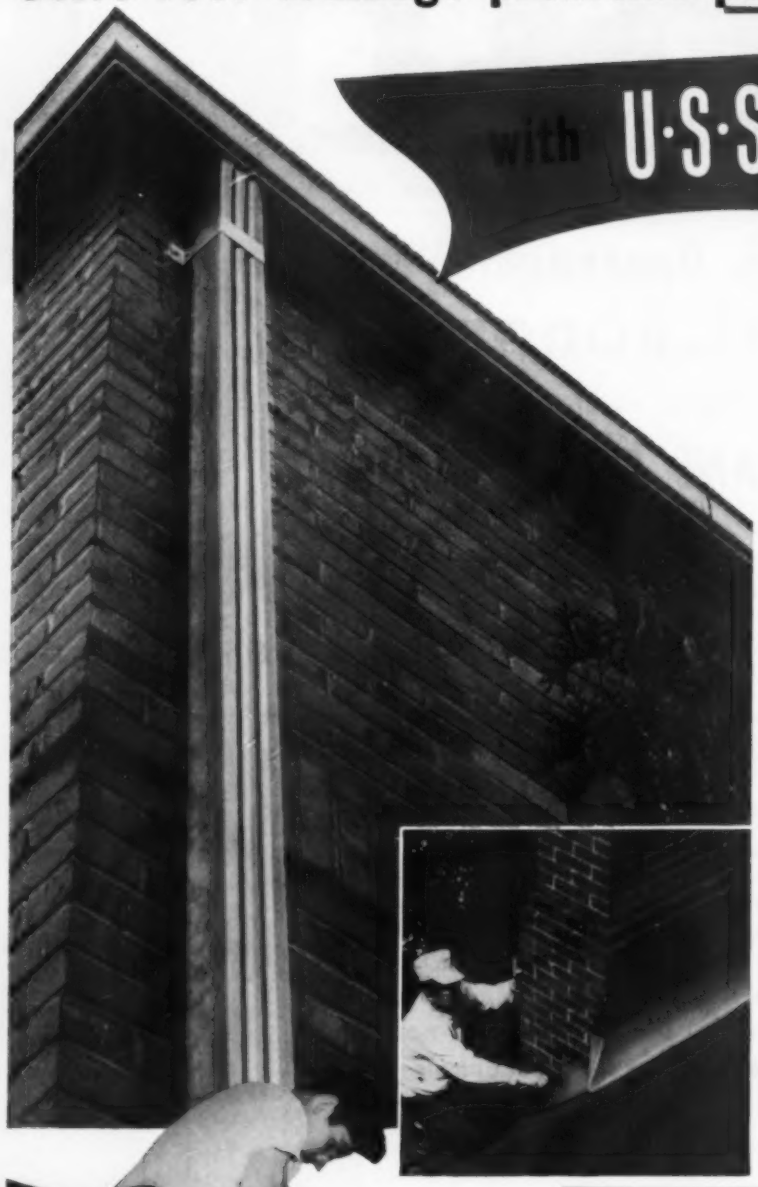
ELECTRIC CO. ST. LOUIS 6, MO.

Controls

FOR REFRIGERATION · HEATING
AND AIR CONDITIONING

Solve roof drainage problems permanently

with U·S·S STAINLESS STEEL



You know of some roof drainage materials that require a lot of maintenance. You know of others that require very little. Here are the facts about one material that requires none whatever!

Stainless Steel is so resistant to corrosion that gutters, downspouts and flashings made of U·S·S Stainless after ten years' exposure in the highly corrosive atmosphere of a Pittsburgh suburb today look as good as the day they were installed. During that time they've required absolutely no maintenance. From all indications they will last as long as the building.

With roof drainage systems built of Stainless Steel, first cost is last cost. No painting is required. No cleaning is needed. Adjacent walls are never discolored by "bleeding." Repairs and maintenance worries are things of the past.

Would your customers be interested in Stainless Steel construction? They certainly would, especially when you can tell them that ***despite its superior qualities U·S·S Stainless construction costs no more.***

It's a fact. Actually the *material* cost of U·S·S Stainless Steel for drainage may even be slightly lower than that of other metals. That's because Stainless Steel weighs about 10% less per square foot than the non-ferrous material used for quality jobs in the past. Thus, gage for gage, you get 10% more usable material with Stainless.

Cost is further reduced because U·S·S Stainless Steel, when formed, has twice the strength of most other metals used for roofing purposes. Thus U·S·S Stainless can be used with perfect safety in *lighter* gages, not only for residential use, but also for commercial and industrial applications that call for heavy thickness in other metals.

U·S·S STAINLESS STEEL HANDLES EASILY BOTH IN FABRICATION AND INSTALLATION

Because the 26-gage U·S·S Stainless recommended for the most applications is so light yet so strong, gutters and downspouts can be fabricated in extremely long lengths which are so rigid that they handle easily and thus greatly simplify and speed up installation. Fabrication of these comparatively simple forms presents no special problems, requires neither special shop procedures nor special equipment.

U·S·S Stainless Steel sheet and strip are readily available now. The proper grade—U·S·S 18-8, Type 302—is stocked by most warehouse suppliers and by United States Steel Subsidiaries. *If you want further information,* write to Carnegie-Illinois Steel Corp., 2085 Carnegie Bldg., Pittsburgh 30, Pa., for our catalog "Roofing Products of Stainless Steel."

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO · CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

9-025

UNITED STATES STEEL

here it is!....

NEW

GILBARCO OIL BURNER

Here it is, the ultimate in modern, streamlined design . . . combined with time-proven Gilbarco principles of efficient operation.

The easiest, fastest burner on the market to clean, adjust and service — with all operating parts completely accessible by removing the die cast aluminum hood . . : the work of only a moment.

And featuring the ECONOMY CLUTCH —the exclusive patented action which makes Gilbarco the easiest of all burners to sell.

The price? This handsome new de luxe Gilbarco costs no more than well-regarded burners of conventional design!

Conversion and Replacement Burners • Boiler Burner Units • Warm Air Conditioners • Industrial Burners

ATTENTION DEALERS!

There are valuable franchises still open west of the Appalachians. Write or wire us for full details.

Gilbarco

THE OIL BURNER WITH THE ECONOMY CLUTCH

Gilbert & Barker Manufacturing Company
West Springfield, Mass., and Toronto, Canada

No more fishin' with a Bare Hook...

use Viking bait and you'll get 'em!

Between 1941-1949 you didn't have to work for orders. It was just like fishing with a bare hook. Everybody bit at anything. All you had to do was pull the juicy orders in and throw back the ones you didn't want.

Fishing for sales in 1949 is going to be a lot different. Today's customer is much choosier; resistance is a lot stiffer . . . and it's going to get tougher. But, remember this—there's as much potential business as ever before. What you'll have to do is use the choicest bait for your sales hook.

There's no question but that Viking's "Qui-ette" Blower Package is the choicest "lure" you can offer. Your potential customers will gobble it up. Now . . . if you'll dangle the other hook, baited with Viking's Humidifier (it's tops) you'll get two "bites" at once without any extra effort on your part.

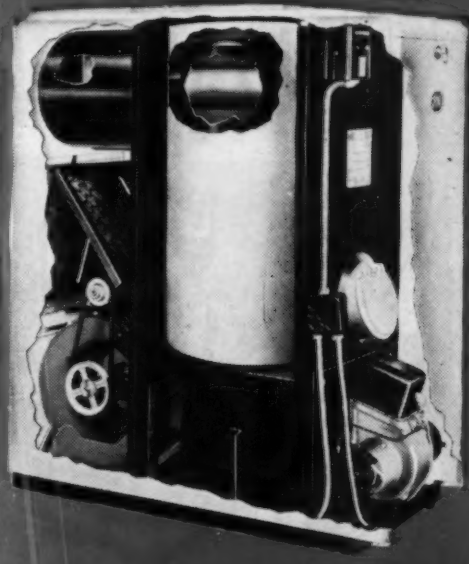
Always use Viking's "live bait" for every fishin' trip. Sold by all good jobbers.

Viking AIR CONDITIONING CORPORATION

5600 WALWORTH AVE. • CLEVELAND 2, OHIO

Easy to Stock! Easy to Install! Designed for oil or gas!

A Unit Designed With The **TRADE** *In Mind*



Four Conditioners—Two Furnaces

AS 12 (small) Gas: 72,000 Btu output—Oil: 75,000 Btu Bonnet capacity.

AS 23 (medium) Gas: 92,000 Btu output—Oil: 90,000 Btu capacity Registers.

White-white Richmond Enameled steel jacket—23" wide x 47" deep. 54" low.

Steel base and channels—no "grouting" needed.

*Unit illustrated: Furnace #AS 23 with gun-type oil burner.

Richmond's "Two Fuel" Winter Air Conditioners

New two fuel furnaces save you money on Storage, Installation, and Inventory...

Easy to Stock: Furnaces can be used for either oil or gas installations, saving you up to 50% on your furnace storage and inventory costs. Each furnace shipped completely assembled in one carton (weighs less than 395 lbs.) with burner units packed separately.

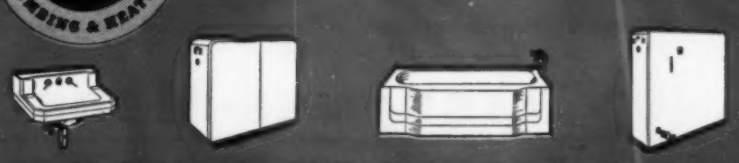
Easy to Install: Furnace unit *only 23" wide*—will pass easily through average size door. Locate furnace, place combustion and burner assembly in furnace unit, spin four wing nuts and make electrical connections at junction box. Then you're ready for supply and flue connections. You'll welcome Richmond speed and ease of installation.

Easy to Change-over: You can switch from oil to gas (or vice versa) without removing the furnace unit or disrupting duct work. Simply disconnect present burner from mounting plate, wiring and supply lines; then slip the new burner into place and connect up. Change-over is accomplished with the minimum of time and expense.

RICHMOND PLUMBING & HEATING

RICHMOND RADIATOR COMPANY
AFFILIATE OF REYNOLDS METALS CO.

"Easy-Fit" precision-tooled Aluminum fittings mean extra profit for you—no layout man needed! Save up to 80% on fitting storage. Light weight, easy to assemble—do your own fitting work.



Plumbing Fixtures: Enameled Cast Iron Ware Vitreous China
Heating Equipment: Oil & Gas Winter Air Conditioners Gas Boiler

CLIP AND MAIL COUPON TODAY

Richmond Radiator Company
19 East 47th Street, New York 17, N. Y. AA-6

Gentlemen:
I am interested in the New Richmond "Two Fuel Winter Air Conditioner ( ) and in "Easy-Fit" Aluminum Fittings ( ). Please send details. No obligation, of course.

Name.....
Company.....
Address.....

Put yourself in your Prospect's Shoes!
dozens of heating plants for choice—but only one name he remembers
FAIRBANKS-MORSE

NEW! Square coal-fired furnace 120CF—with or without air conditioner. Improved design. Slip joint casing makes assembly easier. Can be converted to burn oil or gas.

NEW! Oil-fired furnace 70-OH. Burner and controls come assembled. Occupies small floor area. UL approved. Can be installed on combustible floors. Service man's dream.

NEW! Conversion oil burner FM2. Burns catalytic oils. Motor protected by overload cut-off and a radio interference filter. Easy to install. Simple to adjust.

FAIRBANKS-MORSE stokers are available in bituminous and anthracite models. Both have great sales records. Easy to install. Model Z bituminous stoker shown here.

PROTECTED TERRITORY . . .

Only you can sell Fairbanks-Morse heating equipment in a territory assigned to you. That means you'll never have to worry about being undersold on Fairbanks-Morse products. You, alone, control sales and profits in your territory!

It's plain common sense to recognize that prospects for heating equipment, confused and overwhelmed by dozens of offers, are most likely to choose the products bearing a familiar name.

That's why dealers who sell the Fairbanks-Morse line have a tremendous advantage in a highly competitive market! The name Fairbanks-Morse has been a household word for more than 119 years—a synonym for quality, dependability and value.

Fairbanks-Morse offers you not only a complete line and the name that's been selling for you for more than a century, but other advantages as well. There's a workable cooperative advertising plan . . . a profitable parts service . . . a training school for your service men . . . a full scale national advertising campaign and on-the-ball order filling that keeps customers happy. For complete details, write Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS

"I can seal a pipe joint in 13 SECONDS this NEW, easy way"

"**IT'S SO EASY** to seal pipe with Bauer & Black Industrial Adhesive Tape No. 290! There is no paste, brush, mixing or mess, just a single material in a single size—a 1½ in. x 36 yd. roll of self-sealing **Fiberglas*** tape! You strip No. 290 around the seam, cut the roll loose and the seam is sealed for good—all in less than 15 seconds! The finished job is neat, and the seal actually *improves* with age."

TAPE NO. 290 is outstanding for pipe sealing because of the two unusual materials that make it up:

1. **Fiberglas*** cloth backing—tough, super-strong, resistant to heat, corrosion and aging.
2. Flame-resistant, thermo-setting adhesive. Self-sealing on any sheet metal. *Vulcanizes* under operational temperatures.

Write Dept. T-6 today, or phone your distributor or jobber for full information on Tape No. 290 and other **Fiberglas** tapes specially designed for heating, piping and air conditioning.

7 REASONS WHY TAPE NO. 290 SEALS PIPE BETTER

1. Speedy, safe, permanent seal
2. Sticks fast to any sheet metal
3. Absolutely non-corrosive
4. Increases structural strength of joints
5. No paste, no brush, no mixing, no mess
6. Clean, neat, permanent
7. *Actually costs less to install in many applications!*

*Fiberglas (*Reg. U.S. Pat. Off. by Owens-Corning Fiberglas Corp.*)

A product of

BAUER & BLACK

Division of The Kendall Company • 2500 S. Dearborn St. • Chicago 16

Industrial Adhesive Tape

PRESSURE SENSITIVE

Production Short Cuts to Reduce Costs • Research to Speed and Improve Methods

A job well done is a job done with...

Wheeling
CORRUGATING COMPANY
Reg. U.S. Pat. Off.

GUTTER

CONDUCTOR PIPE

GALVANIZED SHEETS

EAVES TROUGH

ROOFING ACCESSORIES

COP-R-LOY SHEETS

FURNACE PIPE

Wheeling's Modern Equipment Means Uniform Quality

WHEELING CORRUGATING COMPANY • WHEELING, W. VA.

ATLANTA BOSTON BUFFALO CHICAGO CLEVELAND COLUMBUS DETROIT KANSAS CITY
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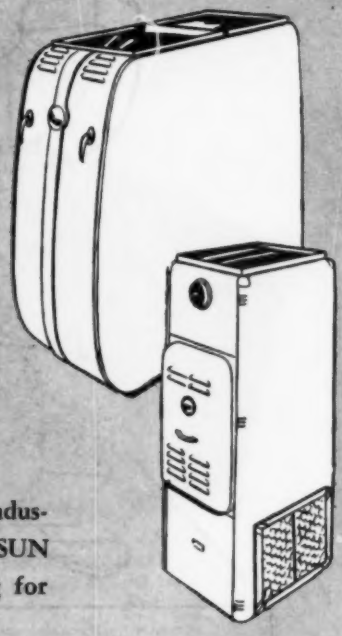
It's Easier with a MOR-SUN PLAN!



Morrison Merchandisers from Maine to Mexico are climbing aboard our 12-gauge, all-die-pressed-steel bandwagon . . . or maybe it's an armored car! Though it's our plan, they're getting the credit — all the credit they need to finance quantity purchases of MOR-SUN Warm Air Furnaces!

What "Sesame" was to Ali Baba, "MOR-SUN PLAN" can be to you. It's the password to business expansion, to quantity purchase discounts, to greater working capital, to the establishment of a sound credit rating, and to all the money you need to make purchases of MOR-SUN furnaces!

Checked and double-checked by leading banking authorities, praised by industrialists, and given a warm welcome by Morrison Merchandisers, the MOR-SUN PLAN for financing purchases through your local bank is now working for hundreds . . .

WRITE, WIRE or PHONE!

It's that "break" you've been waiting for! Bank credit on your purchases of Morrison merchandise — because Morrison guarantees your local bank against loss! Don't wait — send for your — FREE COPY of "THE MOR-SUN PLAN"

MOR-SUN
PRESSED STEEL FURNACES

"The Sun Never Sets with Mor-Sun"

MORRISON

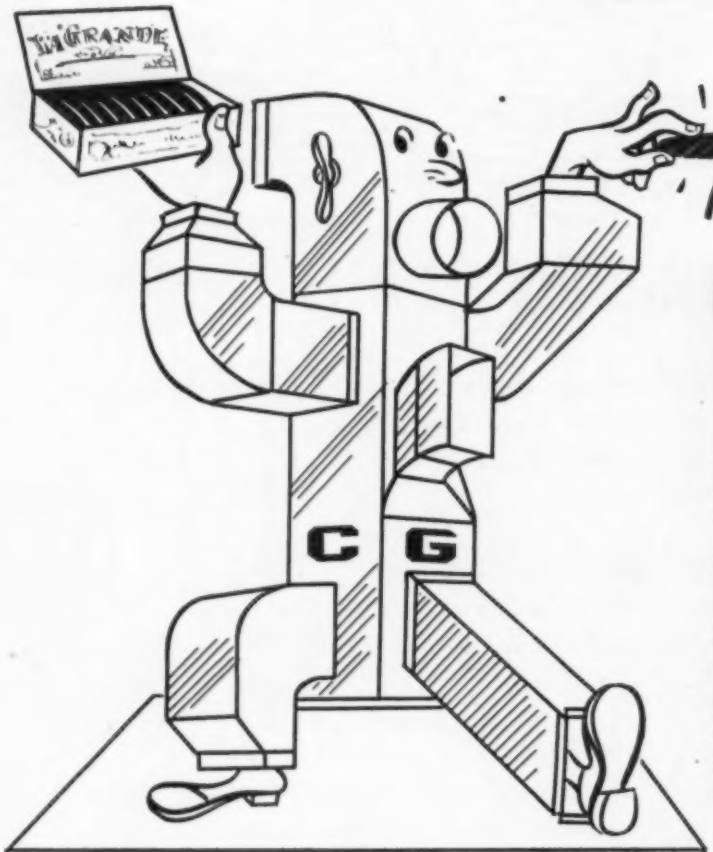
STEEL PRODUCTS, INCORPORATED

601 AMHERST ST. • BUFFALO 7, N. Y.

"SEE GEE"

proudly announces the latest addition to the family!

No. 512—Complete



HUMIDIFIER #518—with the 18" pan for gravity systems is the "big brother" to the #512. If heavy output of vapor is desired, evaporating plates and holding rack may be added to the #518 as well. All Char-Gale humidifiers are shipped pre-assembled, reducing installation labor and time to a minimum. Each complete unit is individually cartoned.

The NEW

CHAR-GALE HUMIDIFIER

Here at last is the humidifier engineered in the Char-Gale tradition of common-sense design and precision craftsmanship . . . combining all the features and more, that you have been looking for. A snap-action valve to give anti-clogging pressure flow . . . a simple pan-level control to fix water level at any desired depth . . . a simplified adjustment slide to attain perfectly level position on any installation . . . and scientific "Activapor" plates to give exceptional efficiency of vapor output.

Corrossion-resistant throughout, the new Char-Gale humidifier is designed not only for exacting performance but for long duty without replacement or repair. And all these features at a lower cost than the average humidifier.

THE CHAR-GALE MANUFACTURING CO.

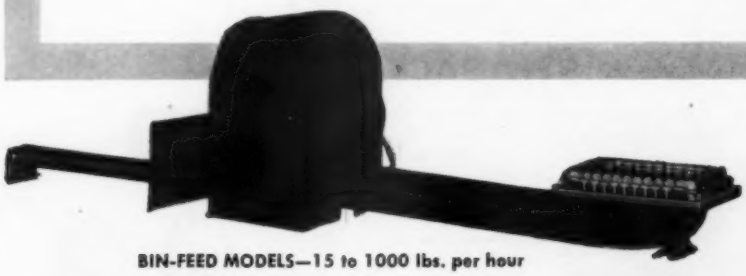
MINNEAPOLIS **OMAHA**

For Top Stoker Profits

DEMAND TOP STOKER FEATURES

In the Combustioneer Automatic Coal Stoker . . . *and only in Combustioneer* . . . you'll find these exclusive features which mean greater satisfaction for your customers and bigger profits for you.

1. **The Automatic Respirator — patented and exclusive automatic air control.**
2. **The "Pulsating" Transmission — thoroughly agitates fire bed.**
3. **"Breathing" Fire Bed — most efficient. More heat per pound of coal.**
4. **Precision engineering and production, heavy duty construction for years of trouble-free service.**
5. **Pioneer leadership . . . more than 20 years experience in manufacturing, selling and servicing all types of domestic and commercial automatic coal stokers.**



BIN-FEED MODELS—15 to 1000 lbs. per hour

HOPPER MODELS
15 to 1000 lbs. per hr.

You'll Get Sales Helps!

Catalogues, folders, post cards, letters, cooperative newspaper advertising and many other selling helps . . . training for your salesmen and service men in our factory school . . . field men to assist you with sales and heating problems.

Write us now, today, for full details of the Combustioneer Franchise and Sales Plan that will help you close every heating prospect, help you make more money!

Combustioneer

AUTOMATIC COAL STOKER

THE STEEL PRODUCTS ENGINEERING CO., SPRINGFIELD, OHIO

The Steel Products Engineering Co.
1229 W. Columbia Street
Springfield, Ohio

Please send me, without obligation, full details of your Combustioneer Franchise.

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

LAU

QUICKER...EASIER PROFITS
New Business for You!

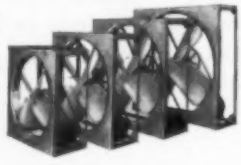
YOU'LL AGREE WHEN YOU SEE

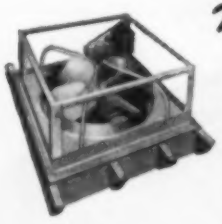
The FINEST LINE *for 49!*

ALL NEW FAN LINE

Niteair **PANEL UNITS**

...newly designed and ruggedly constructed. Four sizes, 30", 36", 42", 48", with discharge capacities for every requirement.





Niteair
RANCHER

. . . especially designed for homes of low roof type construction. Two sizes, 30", 36", with outstanding features and performance.

Niteair
WINDOW FANS

. . . the perfect heat relievers for all homes, offices and apartments. Two sizes, 24", 30". Simple . . . quick . . . easy to install in ANY window in a moment.

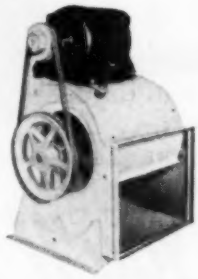
LAU 18" PORTABLE & WINDOW FAN

. . . Amazing all-around performance. Use it anywhere . . . any time! Wonderful cooling results.

LAU Products are indeed the finest and best buy on the market for '49. New handsome designs . . . improved performance . . . superior construction . . . certified ratings all add to the desirability of these outstanding units. Their cost is exceptionally low because they are mass-manufactured for competitive selling. For economy of operation and long, trouble-free service, they can't be beaten. For quicker . . . easier profits, Lau products lead the field. They're "The Finest Line for '49." Get your order in today!

NEW PACKAGE UNIT

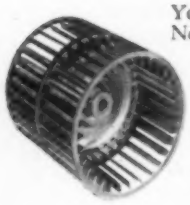
LAU Series 9000 "Package" Blower-Filter Unit . . . Handsome new all-metal casing . . . improved inside and out . . . incorporating many superior mechanical features.



IMPROVED BLOWER ASSEMBLY

LAU Series A Blower Assembly . . . the finest, lowest priced unit on the market. Highly efficient . . . sturdy all-weld construction. Complete range of sizes.

NEWLY DEVELOPED WHEELS



Years ahead of any wheel on the market, the New LAU Series "A" blower wheel has proved its great strength and performance in actual use. Features center suspension, precision balance, all parts die stamped. Single and double inlet wheels 5" to 30" diameter for oil burners, stokers, furnaces, air conditioning units.

Certified Ratings — PMA

Write Today Dept. "A" For Complete Information

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION — INDOOR COMFORT

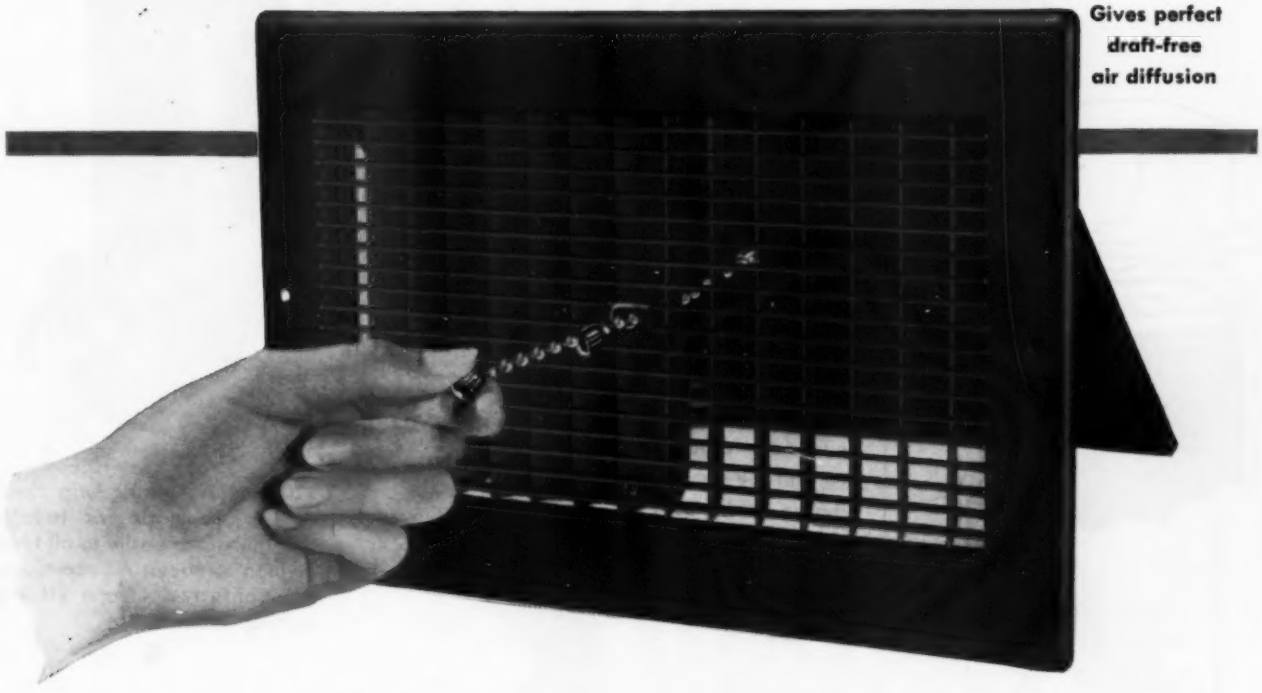
THE LAU BLOWER *Company*

DAYTON 7 OHIO U S A

WORLD'S LARGEST MANUFACTURER OF FURNACE BLOWERS

Lima "WORLD'S FINEST REGISTER"

Ends Need for Quadrant Dampers!



Gives perfect draft-free air diffusion

"Balancing Bell"* Lets Homeowner Re-Balance His Own Heating System!

No more quadrant dampers! No more service calls to re-balance heating systems! The sensational Lima Register simplifies balancing so that it is now a *one-man, one-time job!*

Equipped with the exclusive "Balancing Bell"* control, this new register lets the homeowner adjust and regulate temperature in every room to suit his requirements. And he never has to call you for help!

The Lima Register is streamlined in appearance, gives perfect draft-free air diffusion. Control valve closes tightly for full heat shut-off. Available in three popular sizes for forced air or gravity systems. And new manufacturing processes enable you to make *competitively priced installations!*

*Patent applied for

THE Lima REGISTER COMPANY
LIMA, OHIO

SEND COUPON NOW FOR DESCRIPTIVE BROCHURE ON ALL LIMA REGISTER SIZES AND STYLES

LIMA REGISTER COMPANY
651 N. Baxter Street, Lima, Ohio

Gentlemen:
Please send descriptive brochure on the complete line of Lima Registers and faces for installation in wall, baseboard and floor.

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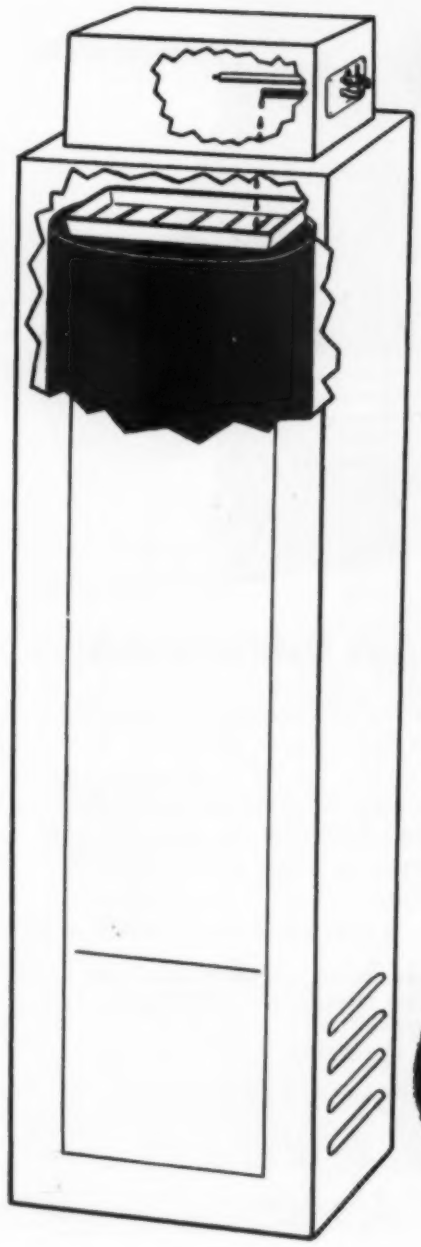
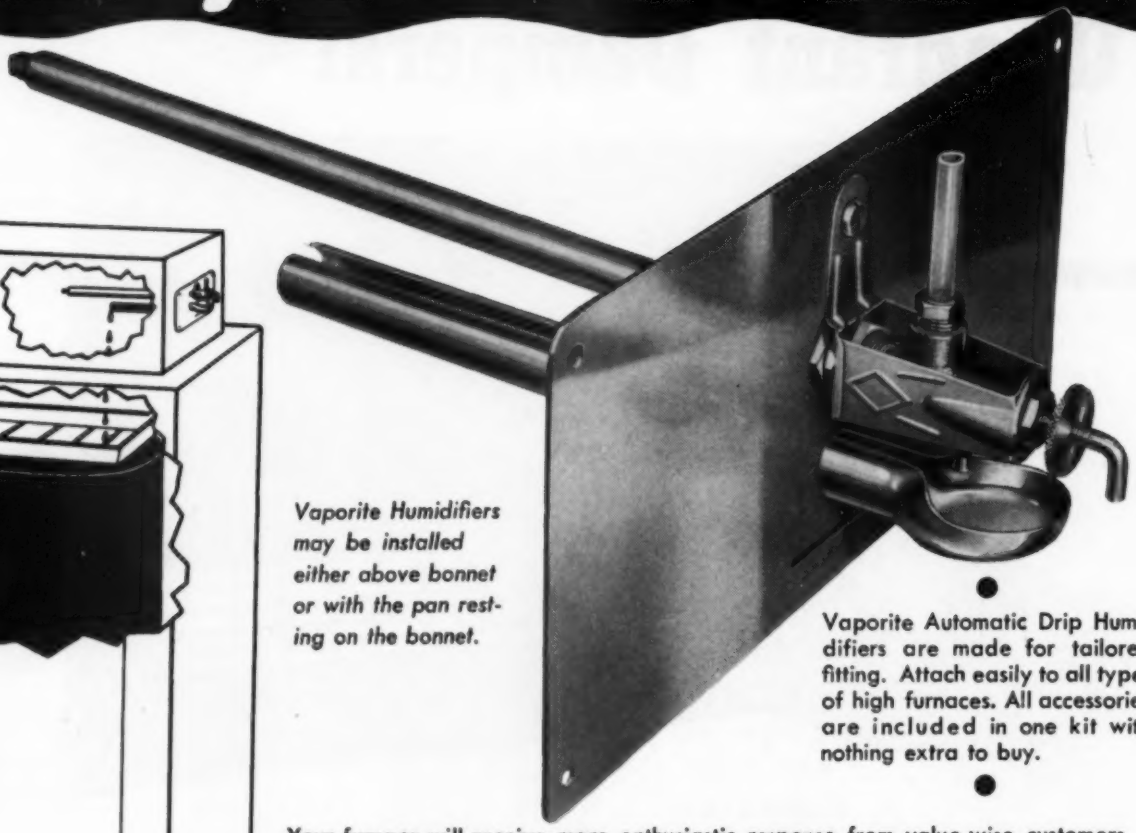
ADAPTABLE TO ALL HIGH FURNACES

Vaporite

AUTOMATIC DRIP HUMIDIFIERS





Vaporite Humidifiers may be installed either above bonnet or with the pan resting on the bonnet.

Vaporite Automatic Drip Humidifiers are made for tailored fitting. Attach easily to all types of high furnaces. All accessories are included in one kit with nothing extra to buy.

Your furnace will receive more enthusiastic response from value-wise customers when you install Vaporite Automatic Drip Humidifiers. They know the advantages of Automatic's bi-metal, fool-proof thermostat — the fingertip control, the long-lasting stainless steel pans. All these advantages and more add up to additional years of trouble-free service. That's why hundreds of thousands of Vaporite Humidifiers are in use now as regular equipment.

Unbeatable Performance Features

- **Air tight valve.**
- **No clogging.**
- **Pan easy to clean.**
- **No electrolytic action.**
- **Valve movement prevents clogging by lime.**
- **Fingertip adjustment for more or less humidity.**
- **No stagnant pool of water left in pan.**
- **Hot pan surface gives immediate vaporization.**
- **Stainless steel pan heats fast.**
- **Easy to install — fits all types of high furnaces.**

Write Today

for FREE literature including prices, deliveries and discounts on the amazing new Vaporite Automatic Drip Humidifiers.

Automatic
HUMIDIFIER CO.
CEDAR FALLS, IOWA

4

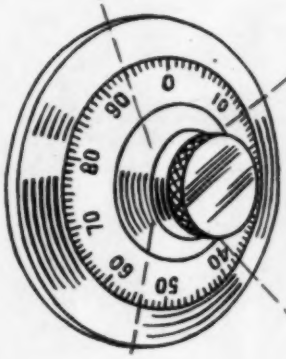
Pressure Burners with firing rates from 7/10 to 12 gallons per hour

2

Wall Flame Rotary Burners with firing rates from 1/2 to 4-1/2 gals. per hour

HERE'S THE COMBINATION FOR MORE SALES!

The Bigger the Line—the Better Your Profits



Yes, Fluid Heat gives you the most complete line in the oil burner industry . . . Rotary and Pressure Burners, Boiler Burner Units, Winter Air Conditioners . . . a great selection of models in each group! Result: you can sell small homes, average homes, large homes . . . with prices to fit every pocketbook . . . satisfy more customers . . . *make more sales!*

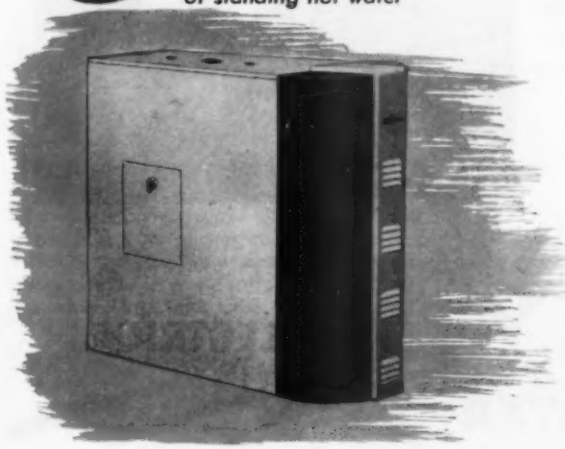
And, Fluid Heat's development laboratory keeps you ahead of competition. Continued research and modification keeps this equipment up-to-the-minute . . . capable of handling any domestic fuel oil . . . able to satisfy any customer. For further information write: FLUID HEAT OIL BURNER DIVISION, Anchor Post Products, Inc., 6720 Eastern Ave., Baltimore 24, Md.

fluid heat
OIL BURNER

"WORLD'S ECONOMY CHAMPION"
Manufactured by Anchor Post Products, Inc.
Baltimore 24, Md., Established 1892

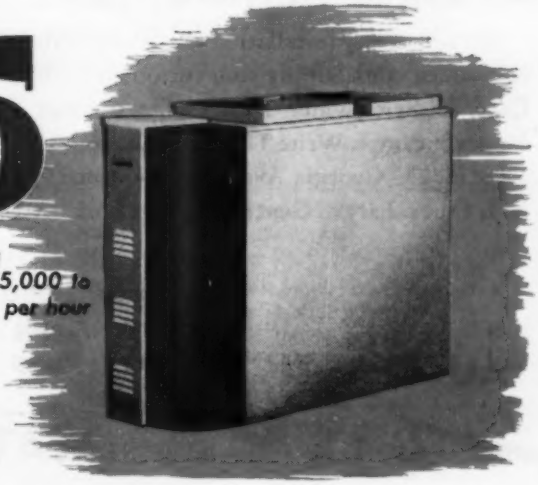
3

Boiler Burner Units from 475 to 840 sq. ft. of standing hot water



5

Air-Conditioning Furnaces from 65,000 to 200,000 B.T.U. per hour



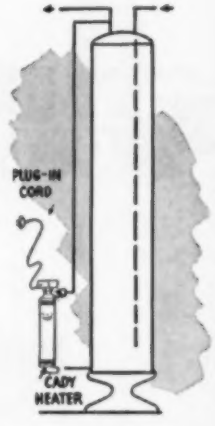
Make "HAY" while the Summer Sun Shines...

with CADY Automatic Electric Water Heaters

HERE'S a simple, economical electric water heater that offers you a chance to make *extra profits* this Spring and Summer. It's ideal for summer homes and camps. Small, efficient, easy-to-install . . . hooks onto any storage tank from 5 to 30 gallons by connecting two pipes and making simple electrical connection. The 1000-watt unit is supplied complete with plug-in cord for any wall outlet.

The Cady Water Heater is a quality product. Heating element approved by Underwriters' Laboratories. Copper and brass waterways throughout. Fiberglas insulated metal jacket. Positive, built-in automatic control. Recovery rate: 1000 watt heating element—7 gals. per hour, 60°F. temp. rise . . . 1500 watt element—10 gals. per hour, 60°F. temp. rise. Overall size 4½" x 16½".

Get added easy installation jobs *plus* profitable added sales. Supply your customers with Cady Electric Water Heaters for summer homes or camps. Write **The Cady Company**, Dept. S, 123 Georgia Avenue, Providence 5, R. I. (Subsidiary of General Fittings Co.)

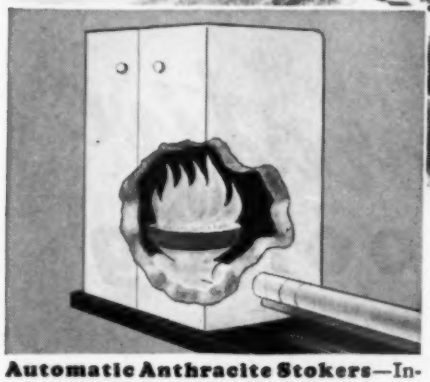


This installation diagram shows exact proportions of Cady unit heater to 30 gallon tank.

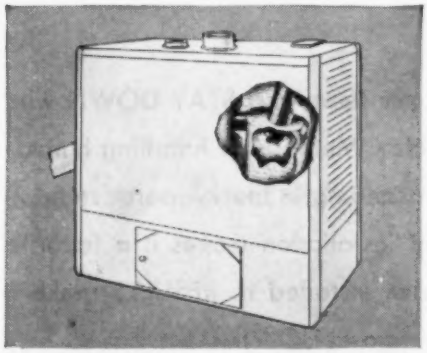
AUTOMATIC CADY ELECTRIC

WATER HEATER

Do your customers still think automatic heat is a LUXURY ITEM?



Automatic Anthracite Stokers—Installed in an existing boiler or furnace and in new houses, automatic hard coal stokers deliver *plenty* of heat quickly . . . save up to 52% on fuel bills . . . eliminate fuel worries.



The Revolutionary Anthratube—The Anthratube saves on fuel bills . . . its proved efficiency is over 80%. This scientifically engineered boiler-burner unit, with "Whirling Heat" and other revolutionary features, produces quicker response and superior performance than units using other types of fuel.

Automatic Anthracite Heat offers savings up to 52% on annual fuel bills

• Here's how you can be a real friend to your customers . . . and build good will plus future business for yourself.

Explain to them that completely automatic heat, with modern anthracite equipment is *not* a luxury. . . .

Tell them how a modern hard coal stoker burns the cheaper sizes of Anthracite . . . pays for itself in a few years . . . saves money after that.

You'll find that most people will welcome the chance to save $100 to $200 every year . . . particularly when they learn they can have all the comfort and convenience of completely automatic heat. Moreover, you can assure them they will have *plenty* of heat . . . because there's plenty of hard coal now, and for years to come.

Get complete information by writing to Anthracite Institute *now*.

ANTHRACITE INSTITUTE

101 Park Avenue • New York 17, New York

ANTHRACITE INSTITUTE
101 Park Avenue, Dept. 6R
New York 17, New York

Please send me more information on Anthracite and Anthracite equipment.

Name_____

Address_____

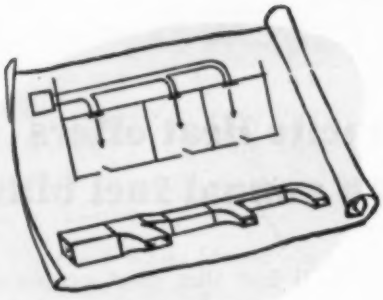
City_____ Zone____ State_____

PLEASE PRINT

it's NATURAL cooling . . .

it's ECONOMICAL cooling . . .

it's COMFORT Evaporative cooling



COMFORT'S FREE ENGINEERING ADVISORY SERVICE *tells you what equipment you need and how to install it.*

Wherever and whenever it's hot (in homes, factories, mills, plants, offices or public buildings) Comfort evaporative cooling brings in fresh, washed, filtered, cooled air to the refreshment of families, employees and clients.

See **that Temperature Come Down** and STAY DOWN with Comfort equipment. New Methods of handling humidity make Comfort outstanding in the evaporative cooling field. Simplicity of installation makes it a favorite with builders who have installed it. RESULTS make it the favorite of those who ENJOY it.

I wish to know more about COMFORT COOLING

Name_____

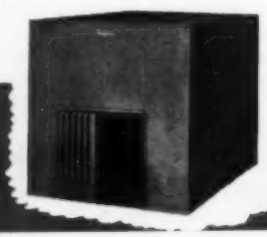
Street_____

City_____ State_____

Your Occupation_____

Title_____

●THERE'S A COMFORT COOLING UNIT TO FIT EVERY COOLING JOB



COMFORT PRODUCTS Corp.

2220 SOUTH LAMESA • DALLAS, TEXAS

ESTABLISHED 1906

UNO ANNOUNCES

20%

PRICE REDUCTION

Quality Unchanged **Efficiently Designed**

Prompt Shipments

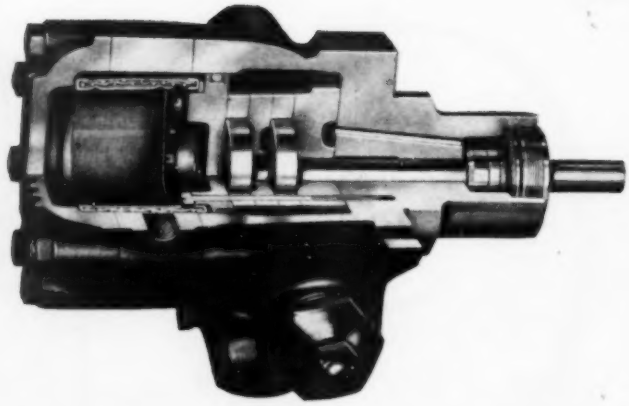
DESCRIPTIVE LITERATURE MAILED ON REQUEST

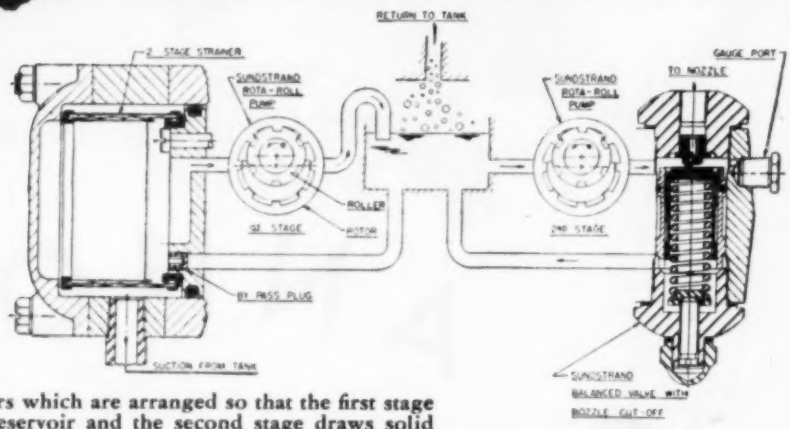
Jobbing Outlets in 40 States

UNO VENTILATOR CO.

CLIFTONDALE STA. **SAUGUS, MASS.**

for LONG LINES and HIGH LIFTS





Schematic drawing of model R Sundstrand Fuel Unit. Note location of first and second stage Rota-Roll pumping members which are arranged so that the first stage discharges into the top of the reservoir and the second stage draws solid oil from the bottom. Excess oil along with any air which may be drawn into the unit is discharged from the top of the reservoir and returned to the tank.

Use Self-Purging Two Stage Sundstrand Model R Fuel Units

When you find a "two-pipe" oil burner installation where the tank is outside . . . or, where suction lines are extremely long . . . or, the bottom of the tank is considerably lower than the pump on the burner, you'll do a better job with a Sundstrand Model R fuel unit. They are self-purging and operate quietly and efficiently up to 25 inches of vacuum. They have all of the outstanding features incorporated in the design of all Sundstrand fuel units.

The Model R units are made in either 6 or 10 gph nozzle capacity. Capacity of pumping members is 18 and 21 gph respectively, based upon 1725 rpm and 100 psi. Underwriters strainer rating is 6 and 10 gph.

Write for Complete Information

This 6 page folder contains complete data on the 16 available models of Sundstrand Model R fuel units. Write for your copy today. Ask for bulletin No. A-42.

SUNDSTRAND MACHINE TOOL CO. · ROCKFORD, ILLINOIS, U.S.A.

SUNDSTRAND HYDRAULIC DIVISION

2561 ELEVENTH STREET • ROCKFORD, ILLINOIS

FUEL UNITS • HYDRAULIC PUMPS • TRANSMISSIONS • FLUID MOTORS • VALVES and CONTROLS

Look to Armstrong for leadership
in warm air heating.
A complete line — oil, gas and coal.

ARMSTRONG
DEALER
MERCHANDISING

here's a complete merchandising program to help you sell in a buyer's market

ARMSTRONG
FURNACE COMPANY

• During the war years, and for a while after the war, businessmen talked about the buyer's market—and wondered when it would come. No more wondering now—the buyer's market is here! That means just one thing in the heating field—furnaces aren't going to be bought by prospects who walk into your shop—they are going to be sold to prospects you find by working a carefully arranged merchandising plan.

You won't find signs on the houses to tell you where these prospects are. You'll have to find them yourself—and the best way to do that is to get into basements and look at furnaces!

The Armstrong Merchandising Plan is designed to help you get into basements in a Spring and Summer sales campaign. It includes every available selling aid—from advice on canvassing to carefully designed direct mail material—from advice on telephone solicitation to completely prepared newspaper advertisements. And it includes material for year-round use, too. It will help you sell heating equipment.

Armstrong heating equipment is distributed to the installing dealer through authorized Armstrong wholesalers. Write or wire us for the name of the Armstrong distributor nearest you. If you are a wholesaler, your territory may still be open. Write today for details on Armstrong Selective Distribution.

ARMSTRONG
FURNACE COMPANY

COLUMBUS, OHIO DES MOINES, IA.

Recommend Stainless—

and Call Ryerson for Quick Service

You can please your customers and increase your profits by recommending stainless. Use Allegheny Stainless when sheet metal jobs call for longer lasting, better looking materials. Quick, convenient Ryerson service provides the stainless you need *when* you need it—in any quantity, any type, gauge or finish.

When you call Ryerson, you get Allegheny Stainless—the time-tested product of America's oldest producer of stainless from America's pioneer stainless distributor. A quarter-century of stainless experience enables Ryerson to help you in specifying and fabricating this profit-building material.

Your regular shop equipment is sufficient for fabrication of Allegheny Stainless in most sheet metal applications. Your stainless customers will profit because this beautiful heat and corrosion resistant metal requires virtually no maintenance. Often it costs no more in the long run than other materials regularly used for quality jobs. So go after stainless business and get quick shipment from your nearby Ryerson plant. We'll be glad to work closely with you.

PRINCIPAL PRODUCTS

BARS—Carbon & alloy, hot rolled & cold finished

STAINLESS—Allegheny metal plates, sheets, bars, etc.

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Sheared & U. M., Inland 4-Way Floor Plate

TUBING—Seamless & welded mechanical & boiler tubes

SHEETS—Hot & cold rolled, many types & coatings

MACHINERY & TOOLS—For metal working

STAINLESS FABRICATING TIPS—Write today for your copy of our helpful booklet on Allegheny stainless fabrication.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • DETROIT • CINCINNATI CLEVELAND • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

AMERICAN ARTISAN

The Welfare State Challenges Free Enterprise

AMERICAN business is rapidly becoming conscious of a real danger inherent in the concept of the Welfare State. Until recently many business men gave little heed to this philosophy of government, confident that it would never gain acceptance in a nation which owes so great a debt to the Free Enterprise system.

Events such as the last election, however, indicate a small majority of the electorate that voted do not fear the Welfare State, but think it might be a worthy idea. During the last stages of his campaign, President Truman spelled out the benefits that would accrue to each group from the Welfare State. The voters must have known what philosophy of government they were choosing.

Now that business has recognized the danger, it is striving to explain how free enterprise works; what it means to the individual worker in terms of hourly wages, suits of clothes, and high standard of living. But as it carries on this program there is the haunting fear that it has begun too late.

Both the nation and the individual have prospered from the benefits of free enterprise; the nation has acquired the world's highest standard of living and the individual has controlled his own destiny. But the welfare legislation which has been proposed would intrude the restrictive influence of government into all business relationships.

Current proposals of public housing and employee welfare exemplify the manner in which government intervention expands. The heating and sheet metal contractor is vitally concerned with the issue of public housing since it places him in double jeopardy. It not only curtails the potential market but takes some of his tax money to support the housing units. A bill introduced into the House of Representatives, H.R. 4009, declares that the general welfare and security of the nation require the provision of a "decent home and suitable living environment for every American family" as a responsibility of government.

Generations of Americans have been reared in the belief that a home is the reward of hard work and thrift, not the gift of a paternalistic government. In this country it has always been held desirable and worthwhile to pay your own way. When a question of human need arises, this nation has always met the emergency, but as long as we remain a free and democratic society the principle of forcing one man to pay another's rent will be suspect.

Another phase of the effect on business of the Welfare State is the current drive of labor unions for welfare funds and health and security benefits. The welfare fund concept began with a royalty exacted for every ton of coal mined. This concept has expanded to a point where contractors of this industry are now faced with vastly increased demands and no one can predict a stopping place.

As an illustration of the current position of labor unions in this matter, here are the 1949 demands of the United Automobile Workers, CIO:

- $100 a month pensions at age 60 after 25 years service, with graduated pensions for shorter service. Administration by a board of trustees on which the workers are equally represented with the employer.
- The pensions are to be paid from employer-financed trust funds, and are to cover everybody in the bargaining unit.
- Five per cent of the payroll to be paid by the employer into a health and security trust fund for health and security and related purposes. The fund to be administered by a board of trustees with union representation equal to that of management.
- Payments of at least half a worker's wages for periods during time out for illness or accident.
- Full payment for all hospital expenses for the worker and his family.
- Full payment of the costs of all medical care for the worker and his family.

These demands clearly indicate the manner in which welfare programs can mushroom, once they gain a foothold in the economy. The Welfare State begins with the avowed purpose of providing for the general welfare, but bureaucracy soon injects itself into more and more phases of business operation, and who could resist such enroachment?

It is to the benefit of business in this country that the full meaning of the Welfare State has been recognized, and is being opposed with every publicity tool available. Let us not underestimate the importance of this struggle.

Arnold Kruckman's

THE latest joint report of the Securities and Exchange Commission and the Federal Trade Commission estimates 1948 net income of corporations, after all taxes, at $11.5 billion, a 14 per cent increase over the net income of $10.1 billion after taxes in 1947. It is particularly marked in the report that the increase was experienced only by the largest class of corporations, those with assets of over $100 million. The rate of increase for these economic octopi ranged from 13.3 per cent in 1947 to 16.8 per cent in 1948. The report states: "In contrast to this trend, all other size classes showed declines in profit rates. The smallest size class, corporations with less than $250,000 assets, showed the largest drop, from 14.4 per cent to 9 per cent." The report especially points out that the profits of the iron and steel corporations increased 35 per cent, and the non-ferrous metal industrial giants increased their profits from 25 per cent.

The report strikingly gives point to the address of George F. Meredith, former director of the Senate Small Business Committee, now director of the National Independent Business Alliance; this address was given before the annual convention of the Sheet Metal Contractors' National Association in Washington, D.C., on May 10. It made such an impression upon those who heard it that the directors of the association requested J. D. Wilder, the executive secretary, to send a copy of it to all members. This review will be confined to quotations of significant parts.

Future of Business

Mr. Meredith recalled his experience as director of the Senate Small Business Committee, which committee was killed in December by the action of the bigger interests. "Out of this experience," said Meredith, "has developed three very clear conclusions—first, that our capitalistic system of free enterprise and equal economic opportunity under competitive conditions is rapidly deteriorating, and is already near extinction; second, a specific plan of action is required to preserve the capitalistic and democratic America we have known and that we love; and third, that the framework of our Government, so wisely designed by the architects of 1776, provides the only adequate structure for restoring the economic freedoms and opportunities that are so rapidly disappearing from the American scene.

"Turn back a few pages in the brief but extraordinarily brilliant history of this nation. What were the conditions that inspired the original migration from Europe to America? Doesn't all our history show, from the very first settlement in this new world, we have had to fight endlessly to preserve the principles that have made this country great, and to exclude the policies that have led the older countries to deterioration, impotence, and total dependence upon America even for survival?

"The old world was, and always has been, characterized by monopoly. The people who fled from the old world fled from the restrictions of monopoly to this new world where they hoped to build a life in which a man had the freedom to think and develop as he willed.

"Free men inspired by equal opportunity can always out-produce and out-compete the uninspired tools of monopoly.

Colonies Outsell Homeland

"The early Colonists soon began to outsell the British in the world markets. This disturbance of the status quo was not tolerated by the British monopolies, so the British Parliament enacted a series of acts to restrain American trade. The Navigation Acts restricted the transportation of goods to and from the Colonies solely to British ships. The most important products of America could be sold only to Britain. It was greatly to the convenience and profit of the Colonists to ship these products directly to the European market, but the English ordered they must first pass through England. From England the British monopolists re-exported them to Europe. On the other hand, the Colonists could import only from Britain. The Americans found themselves in an intolerable squeeze—they could sell only to the British monopoly—at prices fixed by the monopolies—and they could buy only from the British monopolies, at prices fixed by these same monopolies.

"In 1763 the Parliament forbade America to export wool, and woolen goods; hats, and some similar products *from one colony to another even though the distance might be a few miles.* The wool, woolen goods, and hats had to be shipped to England, and then shipped back to America; or distributed by the British agents of the monopolies in America.

"In 1750 the Colonists were forbidden to erect any more mills which made the colonial equivalent of sheet metal. Most of the forges in Pennsylvania promptly were forced to close despite an abundance of cheap ore and fuel.

"Underlying the resounding phrases and ideals of the American Revolution there was a solid foundation of

Washington Letter

economic grievances. The Boston Tea Party was an outburst of defiance to monopoly. The British Government had given the East India Co., the monopoly of selling tea in America, absolutely eliminating the independent Colonial merchants from handling any tea whatsoever.

"Like our forefathers of 200 years ago we are determined to preserve the American concept of life free from the paralyzing dominance of monopoly. If we once reach the startling conclusion that our Government is employing taxation with discrimination against independent smaller business, as onerous and confiscatory as the British burdens upon the Colonists; if we finally perceive that American monopolies of industry and finance are as frustrating and destructive of independent smaller business as the British monopolies were killing to the Colonial industries and commerce, then, I assume, we will develop the same strength and courage the early Americans applied to restore their self-respecting integrity.

Capitalism Defined

"I have said our capitalistic system of free enterprise and equal opportunity, under competitive conditions, is rapidly deteriorating and is already near extinction. To understand clearly, we must define capitalism. Webster defines it thus: 'An economic system in which the production and distribution of wealth, the employment and reward of human labor, and the extension, organization, and operation of the system itself are entrusted to and effected by private enterprise *under competitive conditions*'. Mark the two phases: 'private enterprise' and 'competitive conditions'. The most vocal advocates for private enterprise are the monopolists who are now engaged in destroying capitalism in America by wiping out the competitive conditions that are just as vital to the preservation of our system.

"Wendell Berge, former assistant attorney general, and head of the Antitrust Division, told the House Small Business Committee last November: 'The accumulated evidence in antitrust investigations, by the volume of data compiled by the Temporary National Economic Committee and by other Congressional committees, reveals the vast extent of monopoly control of our largest industries—the metallurgical industry, the chemical industry, the electronics and electrical equipment field, the production of pharmaceuticals, the manufacture of precision instruments and machines, the distribution of foodstuffs and tobacco, the petroleum industry, and even investment banking with its vast control over money and credit. This by no means exhausts the list. It is only a sampling. I do not think the American people or the Congress has been sufficiently aroused to the danger this growing concentration of economic power presents to capitalism and democracy'.

"Ten years ago the TNEC revealed that one third of all the products manufactured in the United States were produced under conditions that enabled the largest four producers to turn out from 75 per cent to 100 per cent of the total production of the items involved. Of the 70,000 manufacturing corporations in America the 113 largest, each with assets exceeding $100 million, own 43 per cent of the total assets of all the manufacturing corporations, and *own 50 per cent, one half of the total industrial property plant and equipment of all industry,* of this nation. This concentration of industrial and economic power is the greatest danger to our capitalistic system because it eliminates basic competition.

"The terrible significance of this situation was dramatically presented to the U.S. Chamber of Commerce at its recent annual convention by Defense Secretary Louis Johnson: 'It is high time,' said Johnson, 'that those few power-seeking and merger-mad corporation officials in our midst realize that the enemies of our economic system are gambling on the hope that American big business by concentrating more and more economic power in the control of fewer and fewer business enterprises, will finally drive us into some form of corporate state. If that should happen, it will be easy for a small group of ruthless men to seize the Government and spell the death knoll of freedom.

Is Steel Competitive?

"The dangers of such concentration were apparent to every user of steel during the recent period of extreme shortage. Recall that competitive conditions are essential in the capitalistic system. Has there been any competition among steel producers to supply *your* requirements? Eighty five per cent of American industry cannot exist without steel. If steel is not produced and distributed under competitive conditions—and you and I know full well that it has not been—then I charge the steel industry has destroyed capitalism, American democracy, in that vital segment of our socio-economy.

"We Americans have no quarrel with bigness. That

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NEWS SUMMARY OF THE MONTH

Warm Air Mid-Year Convention

WHEN THE NATIONAL WARM AIR Heating and Air Conditioning Association meets for its mid-year convention at the Edgewater Beach Hotel in Chicago on June 21st the major emphasis will be on sales. The program has been devised to provide just as much valuable sales information as can be packed into a two day meeting.

One phase of the sales picture will be covered by Carl Lans, director of the Technical Division of the National Association of Home Builders, when he discusses the problems faced by the builder in producing a low-cost house. The development of low-cost houses offering reasonable value is important to the warm air heating industry too, since warm air should hold its traditional position as the leading method of heating.

Carl Lans

Robert W. Roose

The research program of the association will not be neglected on the convention program. Robert W. Roose, University of Illinois, will speak on the plans which have been made for the construction of Research Residence No. 3. This will be a low-cost house and will have a concrete slab floor instead of a basement. During the coming winter tests will be conducted on gravity and forced warm air systems with various duct and register arrangements.

Steel Exports Drop

EXPORTS OF IRON AND STEEL PRODUCTS in 1948 decreased 2,196,000 net tons or 35 per cent from the previous year, on the basis of preliminary reports by the Department of Commerce. The 4,680,000 tons exported was 7.1 per cent of total shipments compared with 10.9 per cent in 1947.

As exports fell to the lowest percentage of total shipments in the past ten years, all but one European country exceeded 1948 iron and steel production goals according to a United Nations statement. Blast furnace output in Europe was 37 per cent greater and crude steel production 29 per cent greater than in 1947.

Excluding Russia, European blast furnace production was about 10,452,000 net tons more in 1948 than in 1947. Steel ingots and castings were estimated as 11,500,000 tons greater than the previous year. In the American British zones, German output of pig iron and ferro-alloys more than doubled during 1948. Crude steel production in Bizone Germany increased 81 per cent in the same period of time.

ASHVE Summer Meeting

THE 1949 SEMI-ANNUAL MEETING of the American Society of Heating and Ventilating Engineers will be held at the Hotel Nicollet, Minneapolis, Minnesota on June 20-22. The program calls for three morning sessions at which technical papers will be given and the remainder of each day will be devoted to recreational activities.

One of the papers to be given at the meeting is titled "Determining Performance of a Blower Used With a Furnace" and is the work of Norman A. Buckley and Robert W. Roose of the University of Illinois. The paper gives the results of a study of blowers used with two types of forced warm air furnaces. Another paper originating from the University of Illinois is "Pressure Loss and Air Flow Characteristics of a Box Plenum." Authors are S. F. Gilman, R. J. Martin, W. R. Hedrick and S. Konzo and they studied the effect of various types of entrance sections in the air distribution, pressure loss and air flow in a box plenum.

A paper by A. B. Algren, University of Minnesota, describes the way in which ground temperatures are affected by weather conditions. For a period of two years a plot of 110 acres was used as a test ground and temperatures were measured to a depth of 16 ft. The author found that the soil at a depth of 16 ft was warmest in November and coldest in April; a time lag of three months from the periods of maximum and minimum air temperatures.

Guy Voorhees Honored

GUY A. VOORHEES, application engineering director of the National Warm Air Heating and Air Conditioning Association and widely-known in the warm air heating industry received an academic award at the commencement exercises of Michigan State College on June 5th. Mr. Voorhees was given an honorary professional degree in mechanical engineering in recognition of the many years he has devoted to the advancement of warm air heating.

The movement to honor Mr. Voorhees was initiated by Lou Reining, well-known Chicago manufacturers representative. Lorin G. Miller, dean of the school of engineering, sponsoring his qualifications for this professional distinction. A group of prominent members of the warm air heating industry was on hand to witness the presentation.

Bulk of New Housing at Lower Costs

CONSENSUS OF LOCAL HOME BUILDERS is that by June, 40 per cent of the newly-constructed homes will cost less than $10,000, another 40 per cent will be rental units and the remainder will sell upwards from $10,000, according to the *Buffalo Evening News*. This is in sharp contrast to the 1948 spring building splurge, when the bulk of new homes cost upwards of $10,000.

Builders report that the shift to lower-priced home

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Simplified Bookkeeping System
For Heating & Sheet Metal Contractors
PART TWO

ARTHUR ROBERTS
Pompton Lakes, New Jersey

IN THE first article in this series, we discussed cash receipts. In this article, we give the fundamentals for handling cash disbursements. Remember that we advised depositing the cash in the bank to the penny as received so that the bank statement is a check against your cash income. You can make the bank statement serve as a check against disbursements if you pay all bills by check. Do not dip into incoming cash to pay any bills, even for 50 cents worth of postage stamps. This does not mean that you must write a check for small payments, such as a purchase of gasoline by the driver of your truck or the collect charges on an incoming express package. Such disbursements should be handled through a petty cash fund. This is the way it works.

Draw a check for $25 or whatever sum represents the average amount needed for small bills in a week or month, cash the check, enter it as a disbursement in the consolidated journal and deposit the cash in a drawer kept for that purpose. Pay small bills out of this cash and put a slip covering the transaction in the drawer. You can buy petty cash slips by the pad in a stationery store. When the cash runs low, draw another check, take out the slips and enter the charges in the proper column in the journal. At all times the slips in the drawer and the remaining cash should equal $25 or whatever sum you have decided upon for the fund. It is best to keep this a fixed fund from period to period.

How to Make Entries

The procedure for making entries for other disbursements is simple enough. The check book is the original source, and so, put the date, payee's name, amount, and the reason for payment on the check stub. It is surprising how many audits we have covered where the check book stubs were entirely blank. This means a lot of extra work checking back. Put enough information on the check book stub to enable the bookkeeper to enter accurately. At the end of the month the total cash paid out is summarized and credited to the cash account. The accounts for which the cash was disbursed are charged. Here again is the double-entry formula—debit and credit—you give cash and get something in return. Inasmuch as the petty cash fund check is also entered, the amount is part of the total credited to cash at the end of the month, the offset is a debit or charge to "Petty cash fund." Cash disbursements from this fund do not go through the regular cash account but are credited to the "Petty cash fund." The offsetting debits are the charges you enter to the various accounts for the items purchased with cash. The columns on the disbursement section of the journal should cover the main expense accounts, a column for "Other disbursements" may cover the entries that occur infrequently, and so, they are condensed in one column to save space. The simplest format for cash disbursements would look like the entries shown at the bottom of the page.

This is a transcript of the check book stubs columnarized in the simplest form. To keep an accurate record of the financial accounts, this is all the bookwork needed for cash disbursements by check. From this record the bookkeeper can transfer the entries to the proper accounts in the ledger. He would have to classify the accounts under "Ledger" each month when making his summary, then post the result or post the accounts individually under "Ledger." This would make more work than if he carried more columns on the cash disbursement page covering those accounts charged frequently during the month, such as labor, office expense, accounts payable, etc. For this reason, the modern procedure is to run more columns for those accounts charged frequently, using an "Other disbursements" column for those items, such as rent, mortgage interest, light, etc., that are paid only once monthly.

The result is merely a more detailed columnar distribution of the "Ledger" column previously shown. Sometimes bookkeepers columnarize all expenses, including rent, repairs, taxes, printing and stationery, postage, insurance, charity, etc. The reader can do this

Date	Check No.	Paid to	Credit Discount received	Credit Cash Drawn from bank	Debit Ledger	Paid for
May 2	78	S. Smith & Sons	5.00	245.00	250.00	Due supplier
May 3	79	J. Jones & Co.		20.00	20.00	Reline truck brakes
May 4	80	T. Johnson		10.00	10.00	Printed stationery
May 5	81	Petty Cash fund		25.00	25.00	To replenish fund
May 6	82	Harry Sherwood		64.10	64.10	Work on Job No. 10
	83	R. Miller		100.00	100.00	Rent
	84	Essex Light Co.		30.00	30.00	Light bill
Totals			$5.00	$494.10	$499.10	

if he wishes. It results in the same answer in the end. We aim to keep the system simple. Standardized systems usually carry special columns for every type of disbursement. They have to do this to meet the varied requirements of purchasers in many fields. We offer the reader the fundamentals so that, if he wishes, he can install his own system, improve it or know enough about bookkeeping to buy a system that fits his business most adequately. The big trouble with many standardized systems is that they are likely to be too complicated for the smaller operators. Our purpose is to show that bookkeeping is so flexible that it can be used effectively by small and large operators. Therefore we start with a simple breakdown of the fundamentals and build up to the more detailed layouts.

Under "Petty cash" he lists all cash pay-outs from the fund, but in this case, he makes no entry under "Drawn from bank" because the payments were made in cash, not by check.

One more element must be considered that did not exist some years ago before the multiplicity of taxes. The payroll was easy to keep in the old days. Today, one must use the payroll record to show:

- Withholding tax
- O.A.B. tax
- Unemployment Compensation Tax—State
- Unemployment Compensation Tax—Federal
- Income tax
- W-2 information
- Workmen's Compensation Insurance
- Vacation credits
- Miscellaneous

This information must be kept accurately. You can do this by adding more columns to the journal sheet or by purchasing special forms in the stationery store to record the breakdown of taxes, making sure that the payroll check entered on the journal sheet is reconciled with the recordings on the payroll record. You may use cards or looseleaf sheets for this form. Big operators enter the payroll in the cash journal and have a payroll ledger to record the breakdown of taxes and labor costs charged to jobs, transferring these entries to the Job Record Sheet.

Arrange Method to Suit

Again we say, bookkeeping is flexible. You can arrange the details to suit your requirements as long as you stick to fundamentals. If you wish to include the tax breakdown on payroll on the journal sheet, just add the required columns. If you pay each employee by check, list the check under "Paid to" and "Drawn from bank" and make the distribution under "Labor." However, if you draw a check to payroll and pay in cash, you would ordinarily enter just one line "Payroll—$265" and put the breakdown on the payroll record card. If

Consolidated

1949 May	Paid to	Check No.	Credit Discount received	Credit Cash Drawn from bank	Debit Accounts payable	Debit Labor
2	S. Smith and Sons	78	5.00	245.00	250.00	
3	J. Jones and Company	79		20.00		
4	T. Johnson	80		10.00		
5	Petty Cash Fund	81		25.00		
6	Harry Sherwood	82		64.10		64.10
	R. Miller	83		100.00		
	Essex Light Company	84		30.00		
	Eastern Telephone	85		12.00		
7	S. Levy-stationer	86		100.00		
9	M and H Company	87		60.00		
31	Postage	xx				
	Gasoline and oil	xx				
	Express charges	xx				
	Fittings for job	xx				
	Totals		$5.00	666.10	250.00	64.10

Monthly summary of journal entries

	Debit	Credit
Accounts payable	250.00	
Labor	64.10	
Materials	60.00	
Truck expense	20.00	
Office expense	10.00	
Other disbursements	267.00	
Discount received		5.00
Cash or bank		666.10
Debits and credits balance	$671.10	$671.10

Name—Harry Sherwood | Year 1949

Address—14 N. Spruce Street | Fed. No. 6728 | State No. 15406

Week ending	Worked Days	Worked Hours	Total earned	OAB	Income Tax	Other deductions			Check No.	Net paid
5/6/49	5	40	$80	80¢	$15.10				82	$64.10

On the journal sheet, a check was drawn to Harry Sherwood for $64.10. This shows the detail of the deductions made. Additional columns may be added to the sheet to cover the deductions. See text for comments on this point.

you include the tax breakdown on the journal sheet, draw a check to payroll and pay a number of employees in cash, you must give each employee a line and make the distribution across the page. This method is acceptable where you have one or two employees. Where there are more employees, it is better to record the tax breakdown on a separate card.

It saves time when calculating the tax paid each employee, or when making payments to the Treasury for withholdings, to have each record complete on one sheet. If you make the distribution in the journal the entries will be scattered and must be gathered together. Given the facts, you can make up your own mind as to how to handle tax recordings. If you are handling them one way now and want to switch, you may do so. Make the switch at the end of an accounting period.

The retail merchant has a much easier time with his bookkeeping. He does not employ labor to install equipment, does not have to estimate jobs; he marks up his goods so much, shelves it, sells it, and credits sales. The *Indoor Comfort* dealer may do the same thing with overcounter sales, but on repairs and installations, which play a big part in his business, he has a more complicated bookkeeping problem. He must keep costs on each job and either record them in his books or use them to check his bookwork.

A customer may buy an electric refrigerator from a hardware dealer, who may make the sale in 15 minutes. Considering the margin earned and the time spent

Journal

	Debit Materials	Debit Truck expense	Debit Office expense	Debit Other disbursements	Debit Petty cash disbursements	Explanation
						Due supplier
		20.00				Re-line brakes
			10.00			Printed stationery
				25.00		To replenish fund
						Work on Job No. 10
				100.00		Rent
				30.00		Light bill
				12.00		Phone bill
				100.00		Typewriter (asset)
	60.00					Sheet metal
					7.40	
					11.50	
					2.42	
					1.40	
Totals	60.00	20.00	10.00	267.00	22.72	

Monthly summary of petty cash drawer

	Debit	Credit
Petty cash pay-outs	22.72	
Petty Cash fund		22.72
Balance in Petty Cash Drawer	2.28	

making the sale, the dealer makes a nice profit. That same customer may come in the next day and buy 50 cents worth of paint and take up more than 15 minutes of the dealer's time in making the purchase and asking questions regarding application. If the dealer should charge his time up against that sale he would lose money. However, timing each unit to determine true profit, the same as an *Indoor Comfort* dealer times his jobs to charge up labor and overhead expense, would be too complicated a costing process, and so, this isn't done. Cost accountants have an axiom, "Never spend a dime to save a nickel," which is applicable here.

The small operator in this industry who uses too elaborate a system, may find the costing process too complicated and costly. It may overload him with paper work. That is why many small operators do not cost their jobs. Once upon a time, they tried it with a complicated system, bogged down under the paper work, and quit.

The *Indoor Comfort* dealer cannot mark up his output the same as a hardware dealer because his installations run into money, because he must use higher priced labor to install, and so, he must cost each job to find out what his profit margin is. If he wants to know what he gains or loses in the aggregate for his business, he can keep only financial accounts such as shown by the layouts published in this and the preceding article, figuring his profit or loss for the business as a whole. But, this won't tell him whether he lost money on certain jobs or how much he earned on others; it will give him no yardstick to help him measure job efficiency. He must have this detailed information to manage profitably. The way to get it is by analyzing job costs, but job costing is as varied as financial accounting. It can be quite simple or very complex. The smaller operator should select a simple system.

Job costing differs from financial accounting. It is a separate process and corresponds to cost work in an industrial plant. Basically, the auto manufacturer costs his production the same way the reader costs his jobs, only the car maker's system is more complicated.

In the next article, we will discuss job costing, how it is tied in with the journal accounts and how it may be handled as a separate recording entirely.

In the first article we discussed Cash Receipts, in this article we covered Cash Disbursements. The difference between the cash taken in and the cash paid out should be the balance in bank, if you deposit all receipts to the penny and make all disbursements by check. The bank statement should be checked against your Cash or Bank account in the ledger as soon as it is received. They should agree when adjustments are made for deposits not entered and outstanding checks. Many members of this industry are lax here. Reconcile your bank statement with your books immediately. If in agreement, you know that mathematically your book entries have been handled correctly.

(From page 72)

construction is being accomplished in various ways, such as smaller houses and use of smaller lots; new construction methods and products; elimination of basements and elimination of some of the finer appointments that went into higher cost houses.

NLRB Rebuffs Counsel

THE NATIONAL LABOR RELATIONS BOARD has unanimously decided that it has discretion to determine whether or not to assert jurisdiction in unfair labor practice cases, regardless whether the complaint is issued either against a labor organization or an employer.

In making the decision that it has such discretion, the board overruled the contention of General Counsel Robert N. Denham that the board members have no discretionary power to decline to assert jurisdiction in an unfair labor practice proceeding.

The board's decision was announced in two orders dismissing unfair labor practice complaints because "the business involved is so small and so local in nature that the interruption of operations by a labor dispute could have only a remote effect on commerce."

Warm Air Furnace Shipments

FACTORY SHIPMENTS OF WARM AIR FURNACES increased over the January level during the month of February, according to the Bureau of the Census, Department of Commerce. Total shipments for the month came to 33,126 units as against 31,855 for January.

Coal fired furnaces accounted for 15,747 units during February; there were 8,834 oil fired furnaces shipped and 8,545 gas fired units. A breakdown by air circulation shows that 51 per cent of the furnaces shipped during the month were forced air furnaces.

Pig Iron Allocations Stopped

SUSPENSION OF PIG IRON ALLOCATIONS under the voluntary plan covering the manufacture of cast iron residential housing items was recently announced by the Office of Industry Cooperation of the U.S. Department of Commerce.

The voluntary plan itself will remain in effect to permit resumption of allocations should conditions warrant. Before suspending the allocations, the OIC contacted all manufacturers of cast iron housing items to determine whether there was any further need for the plan. The plan had been in operation since July, 1948, and had provided pig iron for castings for warm air furnaces (among other housing items).

Home Building Swings Upward

HOMEBUILDING ACTIVITY moved sharply upward in April, with 86,000 new permanent nonfarm dwelling units started, the Bureau of Labor Statistics, U.S. Department of Labor, reported. This represents a gain of 24,000 units, or 39 per cent, over the preliminary March estimate, but is 13,500, or 14 per cent, under the number started in April 1948, when homebuilding was approaching the highest monthly rate on record.

The bureau's estimate of 244,000 new dwelling units put under construction during the first 4 months of 1949 is 35,500 (13 per cent) under the corresponding period of 1948.

Included in the 1949 January-April total are 13,600 publicly financed dwelling units, the majority of which were begun under the auspices of State and local authorities. For the same months in 1948, publicly financed housing totaled 3,700 units.

Employee Relations—Today's Powder Keg

ERNEST W. FAIR
Bristow, Oklahoma

One of the most important phases of business operation is employee relations. The wise employer observes a considerable degree of caution in dealing with his workers. The author points out some principles it would be well to practice.

"WILL our employee relation problems become fewer or more numerous during the year ahead?"

Labor's interpretation of the voters' decision on November 2nd, and its announced purposes following the completion of the election tally, have been all too clear. Industrial unrest is being predicted by all business and political analysts (and not those who forecast election results, either!).

This unrest, noted in years past, will be aggravated and extended by advantage seekers and leave a net result of more and more discontent among employees, even where unionization is not a factor or where staffs are limited to a handful of workers.

The causes of employee discontent will assume greater importance as each week goes by. Good management, whether the business be large or small, will call for more and more attention to the problems of keeping employees happy and content and eliminating the causes of natural, and oftentimes, justifiable discontent.

Many firms have made good progress toward handling this situation. Their experiences have given us a guide to follow. From these firms, and their experiences, we have condensed the more universal causes of employee discontent and how the cure is being handled. They are as applicable to the firm hiring two people as the organization whose payroll numbers hundreds.

No Pat on the Back

Failure to give credit for best efforts, suggestions and application to the job, are the greatest cause of employee unrest. Every one in America has something creative within himself or herself; all of us like to originate things, to work out new ways of doing the things connected with our daily lives. There are many of us who are always willing to work just a little harder than the average.

When no credit is received for extra effort or for constructive suggestions, we become a little discouraged. That credit may be in the form of financial reward, extra time-off with pay, citation on the firm's bulletin board or in a publication, or even a testimonial dinner. The important thing is that the recognition be there; not so much as to how the credit is given or what form it takes.

Failure to investigate and correct grievances is another cause of discontent. Unhappy employees never do their best work; never present a good story to the public and to our customers. Every employee should know that his employer is always willing to listen to any grievance he may have and what is more that something will be done about that grievance. Consideration of the employee's role in the operation of a business helps stave off many a complaint.

Encouragement is needed in every business operation for every employee; failure to provide such encouragement is a prime cause of trouble in any organization. When an employee does a good job he, or she, expects and is entitled to a pat on the back and encouragement to keep right on doing that job.

All of us like to be encouraged; we expect it from our business associates and friends, our trade associations, and those within our own circle. Our employees are no different.

Criticism Misused

Misuse of criticism is another oft-mentioned cause of discontent. Correction and criticism go hand-in-hand and cannot be easily separated; both are needed in the operation of any business enterprise.

The secret is in the proper use of criticism; in avoiding the old method of "calling on the carpet" or in demonstrating a lack of temper control. Any criticism should be prefaced by a compliment or explanation of what is coming. Criticism and correction amount to much the same thing; they differ only in the method through which they are dispensed.

Bad promotion policies have caused as much dissatisfaction among employees as anything else and they have existed in small business firms as well as large organizations. Unfair promotion methods can knock down any employee willing to do his job better every time he comes to work.

When outsiders are called in to fill good openings a firm can always expect resentment among its employees; and in most cases the latter have a good case.

Promotions should always be made from within the organization and in those cases where this is not possi-

ble, every employee should know just why an outsider was called in to fill the job.

Every employee should know that there's more than a routine pay check in his future with the firm; that better jobs are ahead for him, possibilities of larger pay checks, of recognition for merit he expends in behalf of the organization.

The firm whose management never grants a wage increase unless it has been requested is the firm that always has discontent in its ranks. All of us like to feel that the good work we do is being observed and recognized and that it will be rewarded. When we have to ask for raises we know such recognition is not present.

Wage Policy Needed

Wage raises should be an established policy with any business; they should come through achievement and merit, and every employee should know that such wage increases will be his without the asking, when he has earned them.

In larger industrial organizations such matters are handled almost entirely through union-management negotiation; and they will receive more and more attention in the immediate future.

However, in the smaller business enterprise where no such unionization exists, these things are between employer and employee and it is here that the employer is going to have more and more of a responsibility in the months to come.

There will be less trouble in any small business if even the few employees on the pay roll know that when they have earned a raise and the business of the firm merits that raise, they will receive it.

Many other factors enter into the problem of employee discontent. Most are not as prevalent as the foregoing and are more or less found in individual organizations rather than business as a whole.

Some Sore Points

But, these causes of discontent are present, and we must know they exist and combat them. Here are a few:

Failure to receive opinions of employees seriously, concealing too much about the business from employees, the practice of selfishness and favoritism, and the lack of pride in the job the employee holds or in his or her boss and his business.

All of these things are important in good business management. Keeping employees happy and content becomes an even greater problem when outside forces are at work to build mountains out of mole-hills.

How much of this unrest we will have to face in the future remains to be seen. One thing is certain however, judging from trends in the news following the elections, there is every possibility that such complaints are going to be seized upon and used as the means of trouble-making wherever business enterprise exists.

The success of any business depends on the absence of dissension within its organization. Now is a very excellent time for every reader of these pages to conduct searching inquiry within his own business enterprise, discovering any possible sources of employee discontent and seeing that they are eliminated, wherever possible, speedily and efficiently.

Advertising Answer Corner

DAVID MARKSTEIN
New Orleans, Louisiana

WHAT is your advertising problem? If you're worried about general advertising problems on a large scale, or simple, specific, knotty questions about mass selling, send your queries to this department for unraveling.

Q. "Why is it that some advertisers waste money with long-winded copy that goes on for paragraphs and paragraphs? I've always been a believer in short advertising messages that the customers can 'read as they run'. Are the guys whose copy contains hundreds of words wrong—or am I?"

A. Abraham Lincoln was once asked how long a man's legs should be. The great Civil War president gave an answer that is appropriate here—"Long enough to reach the ground." Any advertising message should be long enough to tell and sell its story completely. And no longer.

How can you tell whether your message is long *enough?* Read over the copy after you have written it and ask yourself this question: "Will the prospective customer have the answer to every question he asks before he buys?"

Put yourself in the place of that customer, and imagine that you are in the market, let us say, for a heating job. So you're going to look at the heating advertisements. Then you come across the ad you have just written.

There are dozens of things you, as the customer, will want to know before you buy.

Are Questions Answered?

Have you given the answers to these unspoken questions in your ad? Have you told the prospect everything he needs to know before he buys? Most important of all, have you made your copy a selling message, not just a listing of the features of the job? Have you concluded with a clinching remark to make the reader take action immediately? If you were the reader, would you go down to see, and buy?

Unless you can answer yes to these queries, you have

underwritten your ad. Underwriting is just as bad as overwriting. It loses just as many sales. Many *Indoor Comfort* dealers hold the opinion that prospects will read only short, snappy copy. That this is not so can be proved by the high readership of some ads that contain a lot of words.

The above advice is not meant to be an argument for long copy as such. Overwritten copy is not good. It is dull and hard to grasp.

But copy should not be made deliberately short just for the sake of brevity. Your prospects need to know all about what you sell. Unless you tell them *all*, you have written an advertisement that is only partially effective.

Q. "Which is better illustration material—plain pictures or 'stopper' pictures that catch the eye, such as a pretty girl in shorts?"

A. The ideal illustration is one that combines both, showing the merchandise to advantage by showing it in use. That means showing it with people in the picture.

Many advertisers (and they are not all small operators) tend to use so-called stopper pictures, such as photos of pretty girls in shorts, or pictures of winsome babies, in order to catch the reader's eye. There is one big trouble with this sort of advertising illustration, the people you catch are not very likely to be prospects for what you sell.

In *Indoor Comfort* advertising, the smart man does not aim at any readership that comes down the pike. Instead, he slants his ad so that it will have intense interest for the relatively small group who are true prospects. Getting a non-prospect interested in your ad, at least initially, isn't difficult. But after you've done it, you have accomplished nothing. He hadn't the inclination to buy from you. He just window-shopped your illustration.

By using so-called stopper pictures, you can indeed attract wide attention. But the reaction of the reader who has been fooled into reading your ad is more chagrin and disgust than good will.

You can put stopper features into your ad—if you handle them properly. Cartoons and even leg art can fit into your advertising message *if you take care to make them part of a selling message, and not just a means to attract the eyes of any readers who happen to turn the page on which you've placed your ad.*

C A C Means Indoor Comfort

JAMES M. MARTIN
National Warm Air Heating & Air Conditioning Assn.

THIS year, as never before in the history of modern industry, our economy is dependent upon the success of our selling activities. One of the best sales openers in the warm air heating industry is Continuous Air Circulation. (C.A.C.)

The forced warm air, winter air conditioning system is recognized, not only by heating engineers but also by the general public, as the most economical, convenient and practical means of providing *Indoor Comfort.* Forced warm air, winter air conditioning guarantees the home owner properly heated, humidified, circulated and filtered air. Forced warm air heating provides fresh air and pure air. No other heating system can give all these advantages.

But along with all these advantages of a modern forced warm air heating system came several problems. Users have complained about the alternate blasts of cold and hot air that come out of their registers when the blower cuts in. Another objection owners of forced warm air winter air conditioning raise is that with intermittent blower operation the system sometimes overshoots the thermostat setting. The third complaint sometimes heard the short period of "cold 70" and "hard-to-heat-rooms" that occurs when the blower stops.

In many cases these complaints have been well justified. This condition of air stratification in homes heated with warm air, winter air conditioning has been the weakest link in our sales arguments. Competitors of warm air heating have been quick to utilize these objections to forced warm air heating systems in the promotion of their own types of heating systems. In recent years a number of new forms of heating have claimed public attention and are taking business away from the warm air heating industry.

But these problems have been solved. Some time ago the National Warm Air Heating and Air Conditioning Association, through extensive and practical research, found the answer to these objections. At that time the association introduced C.A.C. (Continuous Air Circulation) to the warm air heating industry through the publication of Manual No. 6. This manual, entitled "Code and Manual for Changing Forced Air Systems to Continuous Air Circulation," contains 12 pages of information on the subject of C.A.C. It covers the approved method for adjustments necessary for automatic controls, blower speeds and combustion rates.

Over 10,000 copies of Manual No. 6 have been distributed to dealers throughout the country, resulting in a number of forced warm air systems being changed

from intermittent operation to continuous operation. These cases have proven, without a doubt, that with C.A.C. added to the many other advantages of winter air conditioning systems this industry need bow to no other form of competitive heating.

What Is C.A.C.?

C.A.C. is a method of controlling the blower so it runs most of the time in mild weather and practically all of the time when the outside temperature is 40 F or less. C.A.C. maintains healthful and comfortable uniform warmth from floor to ceiling from room to room, hour after hour, day after day, the whole winter through.

It takes only a few closely coordinated adjustments to convert a heating plant to smooth efficient continuous air circulation. Actually there are only seven (7) basic things to do:

1. Adjust thermostat to its closest practical differential setting.
2. See that warm air registers and return air faces are open.
3. Check filters. Filters should be clean.
4. Adjust blower speed and controls.
5. Set limit control "cut out" at 175 F.
6. Adjust registers so that air is properly depleted.
7. Adjust dampers to properly balance system for the revised air delivery, and set thermostat for "Comfort Zone."

When each of these seven (7) steps are done right, your customers will get the comfort they bought.

The Public Wants C.A.C.

George Boeddener, secretary and treasurer of the National Warm Air Heating and Air Conditioning Association, tells this story about Mr. John Blankenship, of Storm Lake, Iowa. On a train trip from Indianapolis to Chicago last fall, Mr. Boeddener met Mr. Blankenship. During the course of this casual acquaintance the conversation turned to the subject of heating. Blankenship mentioned that he and his wide had been very dissatisfied with the operation of their new winter air conditioning system. Mr. Boeddener told him the story of C.A.C. and upon returning to the association's headquarters sent Mr. Blankenship complete information and instructions for changing his system from intermittent operation to C.A.C. In January, 1949, Mr. Boeddener received this letter:

> "The first part of October, as you recall, I met you on a train from Indianapolis to Chicago. At that time you explained continuous air circulation to me, and I have been waiting until we have had approximately a month of so-called cold weather before writing to you.
>
> "I changed my furnace as you suggested the middle of November, and we are very pleased with the even temperature we now have. As I told you on the train, my wife complained at times the house was cold just before the furnace kicked on. Since the change has been made she remarks now about the nice warm, even temperature.
>
> "I might add that several others have changed their blowers likewise, and all of us thank you for the trouble you went to in sending me the data."

What's the moral of this story? Simply this . . . the public *wants* C.A.C., and there are over 2½ million forced air heating systems waiting to be changed to C.A.C.

You Can Give Your Customers C.A.C.

You can assure your customer the added enjoyment of a more perfect, more complete comfort, thanks to C.A.C. You can banish the customer's objections to "air-stratification," — "chilly intervals," — and "ankle length" discomforts. The number of inquiries received each week by the National Warm Air Heating and Air Conditioning Association in Cleveland indicates that all the contractor or dealer has to do is ring the doorbell and tell owners of forced warm air heating systems about C.A.C. You can make a good profit by changing these installations from intermittent to continuous operation. You can give your customers the comfort they desire and deserve. C.A.C. is a prestige-builder. It's an opportunity to sell not only C.A.C. but new units, replacements and accessories.

Many wide-awake dealers and contractors throughout the country are selling their share of the 2½ million systems waiting to be adjusted for C.A.C.

A New Short Form

A new short form has been added to the information covered in Manual No. 6. The association, realizing that many more experienced heating dealers would be willing to follow less detailed instructions has prepared a new simplified form. This form, written in easily understood step-by-step procedure, can be used for making the necessary adjustments on all forced warm air heating systems where the blower is controlled by a switch located in the furnace casing or a warm air plenum. This new short form is now being included at no charge with every order for Manual No. 6.

So if you do not have Manual No. 6 order today directly from the National Warm Air Heating and Air Conditioning Association, 145 Public Square, Cleveland 14, Ohio. The price, including the new short form, is only 60 cents.

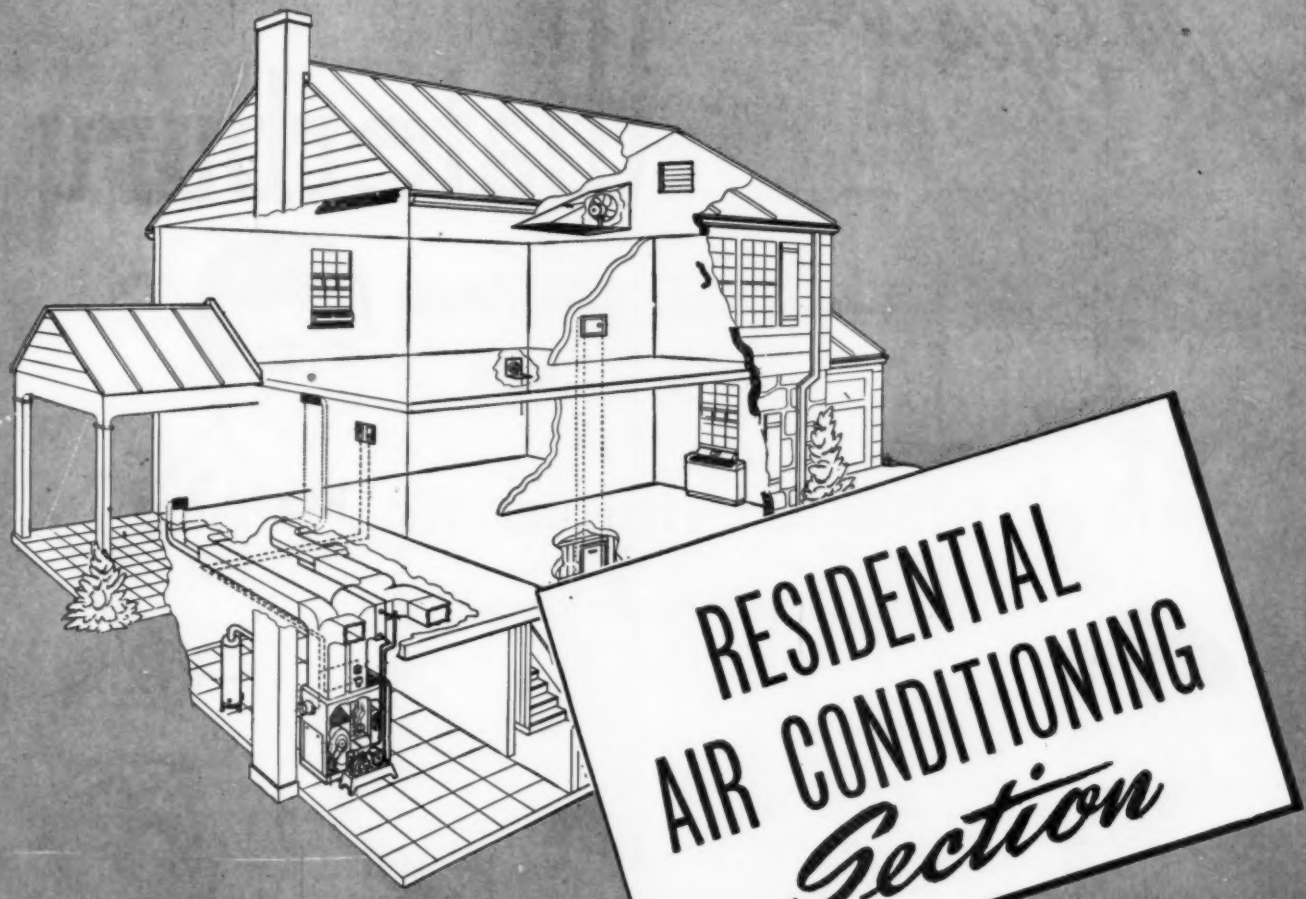
April Steel Production New Record

PRODUCTION OF RAW STEEL IN APRIL was 7,783,807 net tons, a record for that month, despite the fact that operations averaged less than 100 per cent of capacity for the first time this year, American Iron and Steel Institute has announced.

In 12 months ending April 30, the output of steel was over 92,000,000 tons, a record for any 12-month period.

The production of ingots and steel for castings in the first four months of 1949 was 31,835,953 net tons, a record. That amount of steel was an increase of nearly 3,600,000 tons or 12.6 per cent over the corresponding 1948 period.

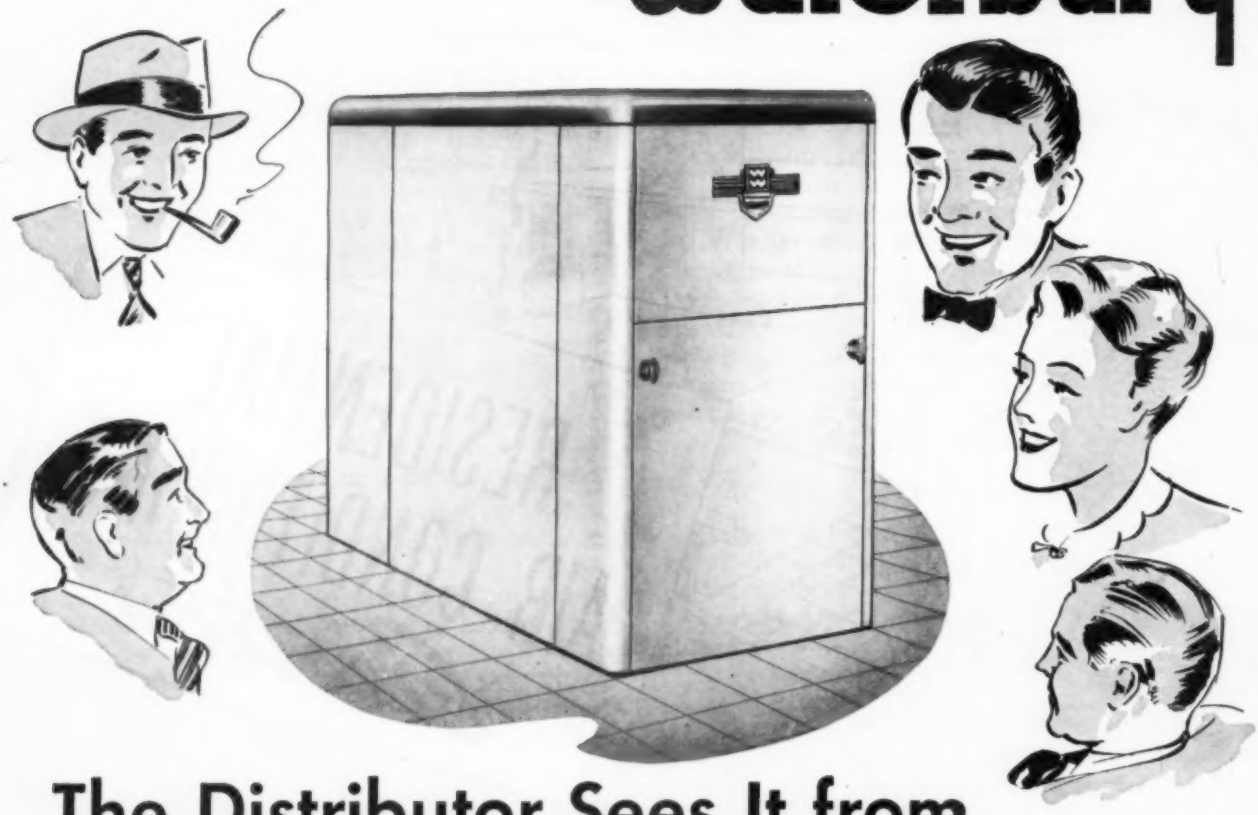
Steelmaking furnaces were operated at 98.4 per cent of capacity in April, compared with the record rate of 102.7 per cent of capacity in March. Average weekly production of 1,814,407 tons in April remained higher than the average weekly output in any month prior to this year with the exception of November 1948.



RESIDENTIAL AIR CONDITIONING *Section*

INDOOR COMFORT — IN ALL SEASONS
FOR HOMES AND SMALL BUSINESSES

All Eyes are On Waterbury



The Distributor Sees It from this Angle

He operates under a specific policy. He has a complete line — a definite territory — factory protection of his distribution rights — friendly and helpful manufacturer-distributor relationship.

The Dealer Looks at It this Way

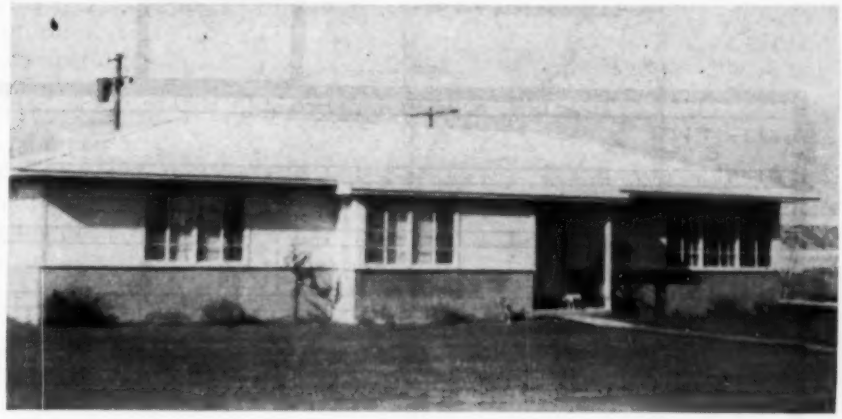
In Waterbury he has a line that permits him to service all types of jobs regardless of size of unit needed or type of fuel desired. A quality line backed by both factory and distributor.

Users have this Viewpoint

They get accepted quality — real home comfort — freedom from service calls — the type of unit they want from hand-fired gravity to panel heating. They have confidence in the unit and in the integrity of both maker and installer.

THE WATERMAN-WATERBURY COMPANY
1122 JACKSON ST. N. E. • MINNEAPOLIS 13, MINNESOTA

At the right is a typical house which was built with a panel-convection system.



O. W. OTT
Los Angeles, California

Panel—Convection Heating System

In Basementless Construction

THERE are two commonly accepted warm air radiant heating systems: ceiling and floor, in which warm air is circulated through ducts or channeled passageways made with guide or spacing strips. As to the use of shallow ducts under the floor, the American Society of Heating & Ventilating Engineer's Guide says this method was used 2000 years ago in many parts of the Roman Empire.

The commonly used systems today comprise closed warm air circuits with the blower and warm air furnace operating to circulate warm air through the duct system and return it for reheating, to the furnace. For a ceiling system the highest permissible surface temperature is given by the Guide as 115 F, and for a floor system as 85 F.

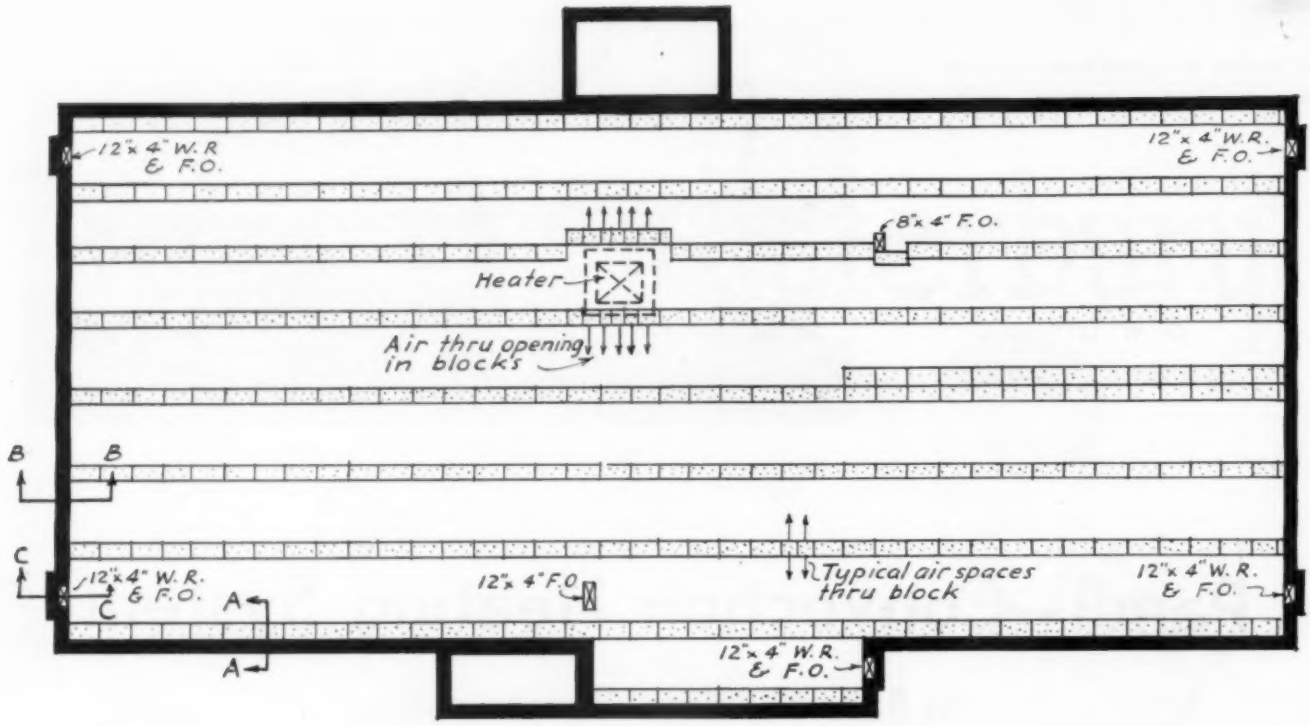
One of the difficulties which is encountered in California, where building construction is seldom designed with much thought of heat loss, is that with more and more glass, and less and less insulation, radiant floor areas become insufficient for minimum outside temperatures.

Panel Heating Plus

To obtain a simple answer to this problem, and a low cost installation for some fourteen three-bedroom houses for the Southern Counties Gas Company pipeline station foremen at outlying locations, the writer worked out a combination warm air radiant and convection heating system. By circulating the warm air from the winter air conditioning unit through an underfloor plenum and then releasing it through side wall registers into the rooms, the floor is maintained at approximately 85 F and additional heat is delivered through the registers from the underfloor plenum chamber. Room air is then returned for reheating to the furnace. The only change in the furnace unit is that the blower handles an increased air quantity for delivery of the required Btu. Instead of a 100 deg. rise commonly used in warm air heating, the maximum rise becomes approximately 50 deg.

The most interesting problem was that of getting a low cost floor construction to obtain a suitable plenum space through which to circulate the warm air on its way to the individual room registers. For these houses the underfloor plenum was constructed as follows: First the ground inside the wall foundations was levelled and tamped and a 2½ in. layer of concrete was placed as a subfloor. On the subfloor, 8 in. high concrete blocks were placed in rows 36 in. on centers as stringers to support the upper floor. The holes in the blocks were transverse to the stringers so that the warm air circulated through them from one aisle to the next. The concrete blocks were 4 in. by 8 in. by 16 in.

Across the top of the concrete block stringers, 26 gauge galvanized corrugated steel was laid as a permanent form for an upper concrete floor 3 in. thick on which asphalt tile floor covering was laid for the finished room floors. Short scoop type ducts with friction-held volume dampers connected the wall registers in each room to the adjacent underfloor plenum between the concrete block stringers. A down-feed blower furnace unit delivered warm air into one of the underfloor aisle spaces, which were 24 in. by 8 in., and through the block cells to adjourning aisle spaces. The furnace was located near the corridor side of a service room which also contained a water heater and laundry tray. A return air duct entered the top of the furnace unit from an interior corridor which had doors leading to the bedrooms and living rooms. In these corridor doors the lower panels were replaced with louvres so that return air circulated from each bedroom and living room to the corridor and thence back to the fur-



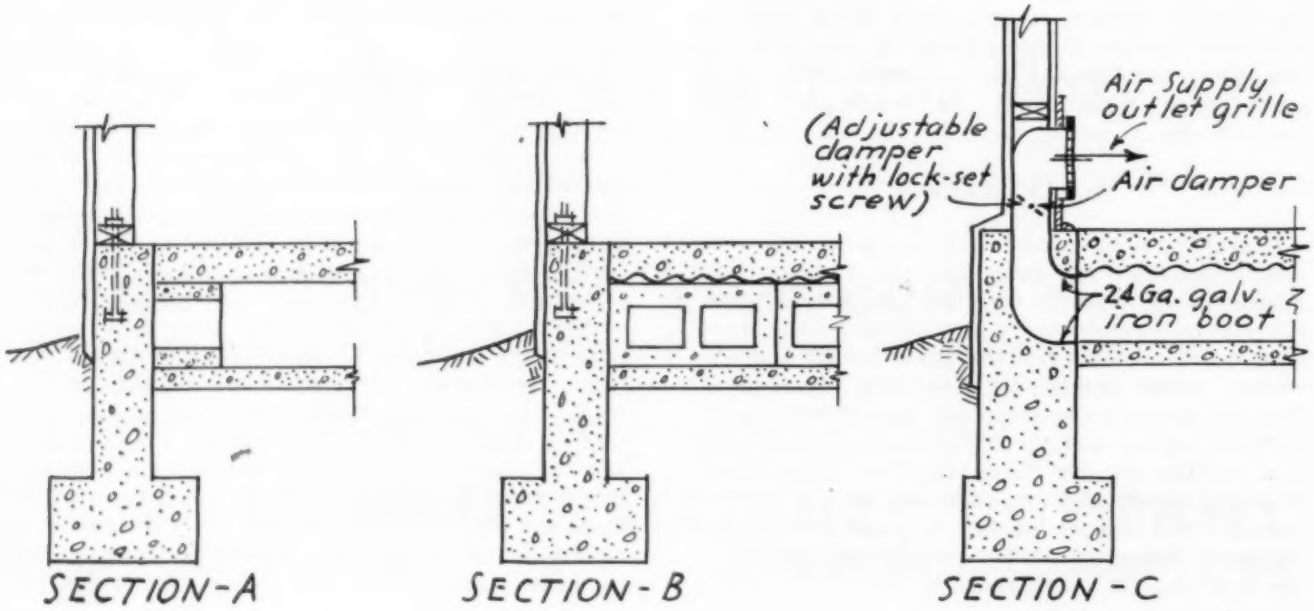
Foundation plan. For sections, see below.

nace. The bedrooms were the only rooms in which shutter registers were installed, as the grilles in the living room, breakfast room, and bath were planned to remain open at all times.

The heat loss calculations for the cottage heating installations were made by using ASHVE Guide standards with cofficients to suit the building construction. The temperature difference used was suited to the climatic zone for the actual cottage locations. Infiltration losses were based on one and one-half air changes per hour as the furnaces operated on a 100 per cent recirculation basis. Standard Guide multipliers for floor losses were increased to take care of an approximate 90 deg plenum temperature and the thin concrete sub-floor.

The only difference in figuring the Btu heat loss for the rooms of the building from the method commonly used was the variation to take care of the ground heat loss.

We did not figure too closely on furnace unit size as we decided that it would be better to make one size unit do for all of the various locations and depend on more or less time for the on periods of blower furnace operation. As mentioned previously in this article the blower air quantity was increased to hold maximum temperature rise to not over 60 deg.



Volume dampers in room convected air delivery ducts were field adjusted for approximately uniform room temperatures and then the duct throat dampers were locked in place by removing and then replacing grilles.

The gas fired furnace unit used in the cottages had a capacity of 120,000 Btu's and was an adaptation of a standard vertical cabinet unit with the blower compartment placed above the heating compartment as shown on the drawing. We have since made plans for other installations using various makes of standard vertical cabinet units with a down duct connecting from the standard top warm air outlet to the floor opening into the underfloor plenum. For quantity installation the down feed furnace unit would undoubtedly be less expensive.

Rapid Temperature Changes

One of the major questions of the gas company executives was as to stored heat and time lag in cooling off for California climate where you want heat for breakfast and cooling for lunch. The answer suggested was that if there should be any difficulty from stored heat after the unit was shut down by the room thermostat we could have the thermostat shut the gas off first and allow the fan to keep on running and circulate room air through the plenum and thus dissipate the stored heat. Last winter's operation indicated that this was not necessary. Standard thermostat control only was used.

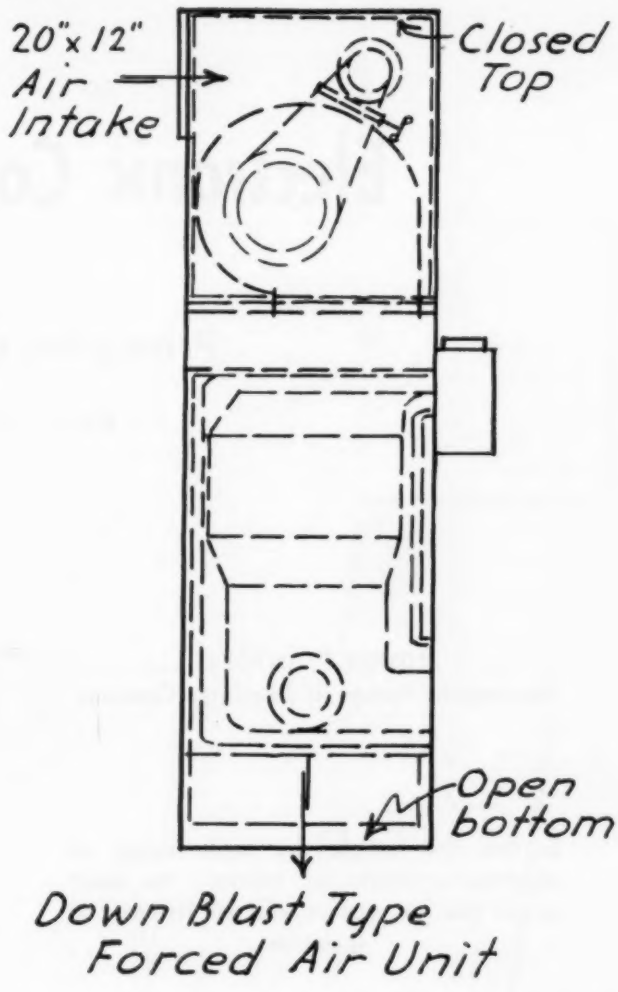
The plans were drawn in 1946, the 14 houses were finished in 1947 and have been in use ever since, and all reports from the occupants have been very favorable.

Cutting Floor Cost

The writer is now making an intensive study as to the possibility of reducing the cost of the floor construction. One architect suggested omitting the lower concrete subfloor and using tamped sand over a thin layer of gravel, a layer of roofing felt over the sand and then sealing the felt with hot tar mopped over the surface between the concrete block stringer aisles. He also prescribed wider aisle spacing with ⅜ in. steel rods in the concrete slab above the corrugated iron form for the upper floor. This design is to be installed in a ten classroom one-story school building. Each classroom will have an individual furnace unit located in a small heater room at one end of the classroom. Thus each classroom will have individual thermostat control of its blower-furnace unit.

Recently a local concern manufacturing concrete blocks brought out a plan for small houses and stores in which the entire floor area between a longitudinal air supply channel on one side and an air equalizing channel on the other side, was paved with concrete blocks with the holes through the blocks end to end, so as to provide warm air channels under the entire floor area. Their literature states that they have made "many installations in residential buildings in the San Joaquin Valley of California in the past two years."

One of the problems in Southern California in frame house construction has been "Termite Control." To get an FHA loan on a bungalow with standard wood girder and joist floor construction above the ground, it



Down Blast Type
Forced Air Unit

is required that what are termed FHA vents must be located at approximately 8 ft intervals on all sides of the house to provide ventilation between the floor construction and the ground below the house. As these vents are approximately 8 by 12 in., and sometimes larger, cold floors result with the standard diagonal subfloor and super-thin hardwood floors laid over the subfloor. The cold underfloor space also absorbs considerable heat from warm air ducts which are run under the first floor to serve the various room registers. A ten to fifteen degree drop in supply air temperatures on the longer duct runs is common where the duct insulation is common asbestos insulation.

A New Market

On the other hand, if the warm air supply ducts are run overhead through the roof space, the heat loss from the ducts is equally great with a shingle roof on 1 by 3 in. battens laid 6 in. on centers. Unless a complete return air duct system connecting to a return grille in each room and extending back to the furnace heating unit is installed, the cold floor problem becomes even worse. Sunny California's 1948-49 winter has upset all the old cold weather statistics, and cold floors and high gas heating bills are common subjects of discussion. The writer believes that there is a big field for the combination radiant-convection installation described herein, once a low cost floor plenum can be worked out.

Electronic Control Systems

Principles of Operation

Part 1 of a Series

EDWIN F. SNYDER
Minneapolis-Honeywell Regulator Company

In this first article the fundamentals of electronic controls are treated; the basic circuit and the vacuum tube and its mode of operation.

ONE of the greatest advances that has been made in the field of heating comfort and safety, is the development of electronic controls. These controls with their sensitivity, simplicity, flexibility and stamina, allow the control industry to accomplish feats never before believed practicable or even possible. These controls, in their very simplicity, release the home owner and dealer from many of the service headaches common with the older style, mechanical type controls. Their sensitivity allows control to a fraction of a degree but does not promote short cycling which has always been the fear with a narrow differential mechanical control. Their flexibility permits the use of the controls on a great many different types of applications with little or no modification of any kind.

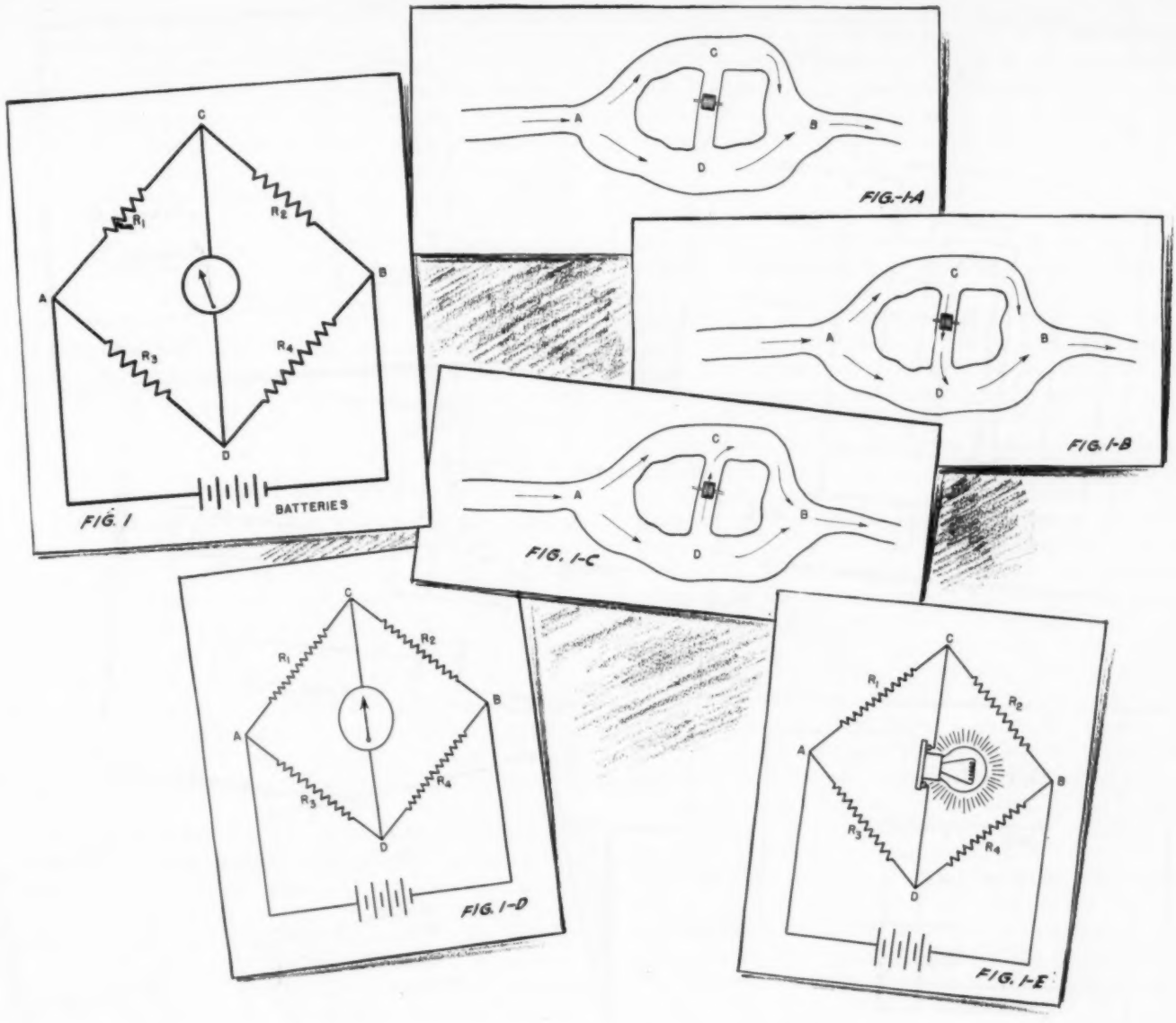
This may seem a lot to claim for any controls but all of the above statements probably do not do justice to this innovation in the control field. However, a look at the basic principles upon which these controls function will serve to show the fundamental truth of these claims. The field of electronic control is rather wide and technical so this article will confine itself to the application of electronics in the domestic heating control field, and will attempt to state the electronic principles in common terms that can be understood by those who are not electronic engineers.

The basic circuit of these electronic controls is the old familiar "Wheatstone Bridge" which is represented in its most common form in Fig. 1. References to Fig. 1 will show that the "Wheatstone Bridge" or bridge as it will be called here, consists of four legs. The bridge is a closed circuit but a voltage is applied across two points such as A and B in the figure. A galvanometer is usually placed across the other two points C and D, and the galvanometer needle will be deflected any time there is the slightest potential difference existing between points C and D as shown in Fig. 1. Each leg of the bridge is made up of resistances and if the value of these resistances are such that R_1/R_2 equals R_3/R_4 then the bridge is said to be balanced and there is no potential difference between points C and D. However, if one of the resistances should be changed so that the above proportion is no longer satisfied, then the bridge becomes unbalanced and there is a potential difference between C and D that will deflect the needle on the galvanometer. This basic characteristic of the bridge circuit and the potential difference that exists when the bridge is unbalanced, are the fundaments that allow us to control electronically.

The Bridge Explained

The above discussion of the "Wheatstone Bridge" might be further clarified if an analogy is drawn between it and the water circuit shown in Fig. 1-A. In this figure, water is considered to be flowing from Point A, which is at a higher level, to Point B, which is at a lower level. Dividing the stream is an island across which is a ditch C-D connecting the two parts of the stream. Considering the fact that the two channels between A and B may differ in width, it is known that the current will split at A with part of the water following one path and the rest following the other path. However, both streams will rejoin at B and continue on as before. It is also obvious that if points C and D are at the same elevation, there will be no flow of water through the channel C-D.

Now consider Fig. 1-B where point C is higher than Point D. In this case water will flow from C to D. In



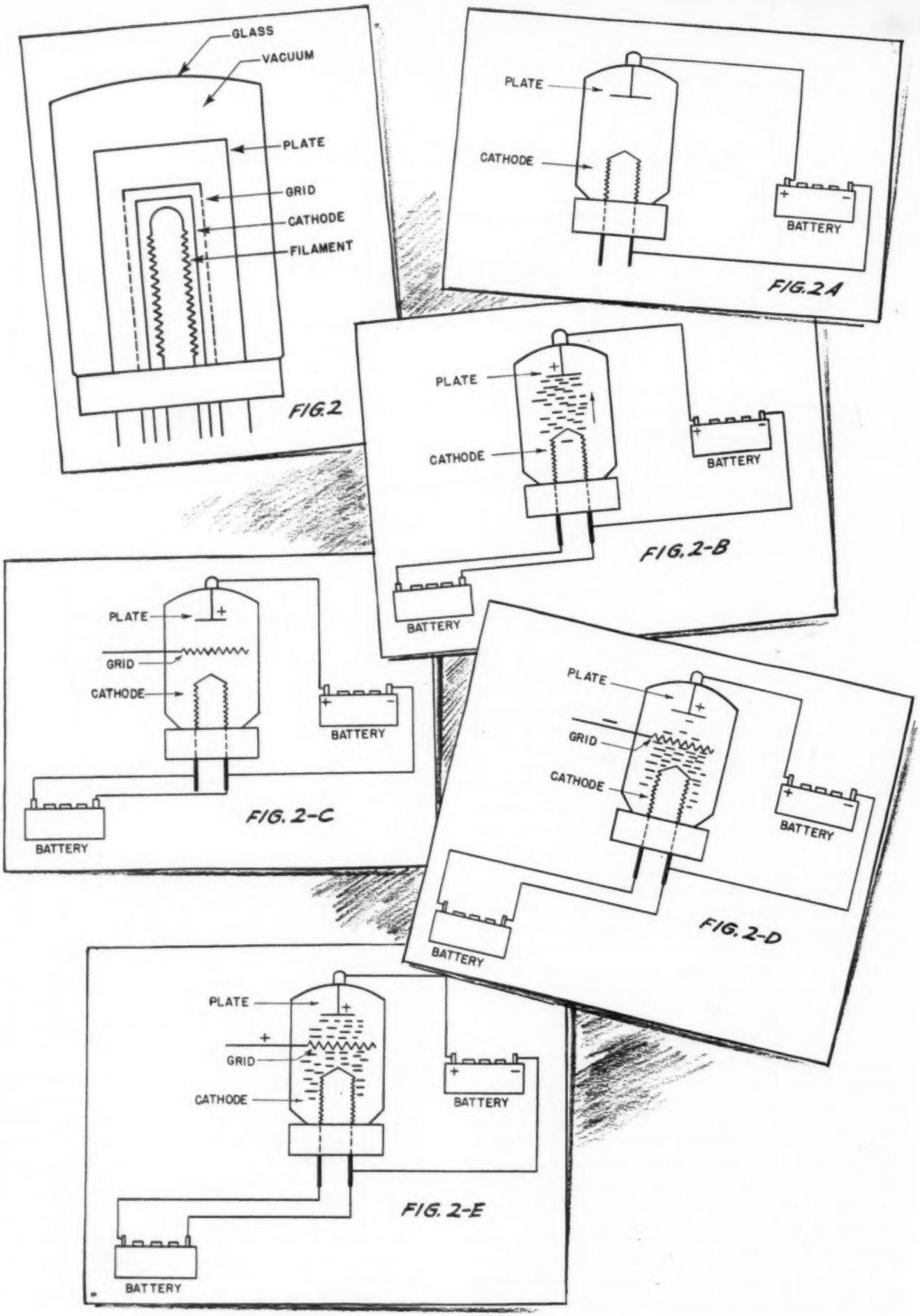
Fi. 1-C, point D is higher than point C so the water flow is from D to C through the channel. In all of these examples, the relative flow in the different channels is dependent, in part, upon the relative elevations at A, B, C, and D. In the same way the division of the electric current in the Wheatstone Bridge depends upon the relative voltages at A, B, C, and D in Fig. 1.

The Water Wheel

In the water analogy above, there might have been a water wheel located in the channel across the island so that a movement of water through the channel would cause the water wheel to rotate. In Fig. 1-A there would have been no rotation of the wheel since there was no flow of water through the channel. In Fig. 1-B the wheel would rotate in one direction and in Fig. 1-C the rotation would be in the opposite direction because the flow of water is in the opposite direction. The galvanometer needle in the case of the Wheatstone Bridge acts like the water wheel does in the case of the split stream. When the flow of current is in one direction, the needle will be deflected in one direction as in Fig. 1 and when the direction of current flow between C and D is reversed the needle will deflect in the opposite direction. When there is no difference in elevation between C and D in the water channel, there will be no current flow through the channel and the water wheel will not rotate. By the same token, if there is no potential difference between C and D in the Wheatstone Bridge, there will be no current flow across the bridge and the needle of the galvanometer will not be deflected, as shown in Fig. 1-D.

The water wheel in the case of the water analogy could be made to do useful work and the amount of work could be regulated by controlling the amount of water allowed to run through the channel. Normally the galvanometer is not considered as doing useful work, but, if the galvanometer were replaced by a small, electric light bulb, the bulb could be made to light up by allowing some current to flow between points C and D and the amount of light could be controlled by the amount of current allowed to flow. See Fig. 1-E.

So far, nothing has been said about electronics in


GLASS
VACUUM
PLATE
GRID
CATHODE
FILAMENT
FIG. 2
PLATE
CATHODE
BATTERY
FIG. 2-A
PLATE
CATHODE
BATTERY
BATTERY
FIG. 2-B
PLATE
GRID
CATHODE
BATTERY
BATTERY
FIG. 2-C
PLATE
GRID
CATHODE
BATTERY
BATTERY
FIG. 2-D
PLATE
GRID
CATHODE
BATTERY
BATTERY
FIG. 2-E

this control system and this might be the best time to discuss this phase of the problem. As mentioned above, the potential difference that exists across the bridge when it is unbalanced, is the means by which we control. Unfortunately, this potential difference must be quite large before it can be used to do any useful work and this would require extremely large voltages across A and B, large resistances and large changes of resistance at R_1, R_2, R_3, R_4. The magnitude of these values would be so great that it could never be hoped to give the features outlined in the first paragraph. Fortunately, the simple little vacuum tube is available and can overcome all of the difficulties mentioned. This vacuum tube is capable of taking a very small voltage and building it up to any strength that is desired. It has been said that the vacuum tube can take a "fly power" signal and build it up to "elephant power."

Vacuum Tube Explained

Fig. 2 shows the essential elements of a common, four element vacuum tube. These parts are the plate, grid, cathode, and filament. The vacuum tube depends upon three physical laws for its basic principle. First, when an element is heated, electrons are given off at an increased rate and the higher the temperature, the greater the rate.

Secondly, the electron, which is a negatively charged particle, is attracted to an object carrying a positive change, and repelled from one with a negative charge. And thirdly, the greater the electron flow, the greater the current.

Now refer to Fig. 2 again and note that the filament is adjacent to the cathode. This filament is heated to a high temperature by means of an external power source and in turn, heats the cathode which has been given a negative charge. Electrons are driven off from the cathode and, since the plate is caused to be positively charged, seek their way by the shortest possible path to the plate, thus creating an electric current.

The grid is the fourth basic element shown in Fig. 2 and its function is to serve the same as a valve in a water line or as a venetian blind in a window. It controls the rate of flow of electrons from the cathode to the plate. By varying the signal on the grid, the flow of electrons can be modulated from full value to a complete stop.

How It Works

With this discussion of a vacuum tube it might be well to pause for a moment to break the tube down to its basic elements and look at each one in detail. As mentioned above, when the cathode is heated it gives off electrons which travel with great speed. Figure 2-A shows a vacuum tube consisting of only a cathode, an anode or plate and the glass envelope together with a source of power. However, the cathode is cold and no electrons are being given off.

In Fig. 2-A, the cathode and plate act like the poles of a switch and with the switch open no current would flow. In the same manner, the switch in the vacuum tube is open and no electrons flow from the cathode to the plate.

Figure 2-B shows the same circuit but now the cathode is being heated by an outside source of power and the plate has been given a positive potential because of its relation to the battery. With the cathode heated, electrons are driven off and the switch between the cathode and plate is closed and the circuit is completed. It can also be seen that the strength of the electron field between the cathode and plate will govern the strength of the current flowing through the tube.

The grid is the last really important element of the vacuum tube and was referred to above as a valve in a water line or a venetian blind in a window. Figure 2-B shows the vacuum tube acting as a switch but the only control over the rate of electron flow would be to vary the temperature of the cathode. This would be a slow process and certainly would not give the precise control expected of an electronic circuit. Figure 2-C shows the same arrangement as Fig. 2-B, but with a grid added. Now there is a way to control the current through the tube. If the grid is negatively charged as in Fig. 2-D, there will be very few electrons allowed to pass from the cathode. However, if the grid is positively charged, as in Fig. 2-E, the electron flow is speeded up greatly. And by controlling the strength of the charge on the grid as well as its sign, it is possible to control the strength of the current flow from cathode to plate very precisely. Thus, a very small amount of power applied to the grid controls a large amount of power in the plate circuit. Or, as mentioned before, fly power becomes elephant power.

Previously, it has been shown how a bridge circuit would control the position of a galvanometer needle by means of its condition of unbalance in the bridge. By the same token, the analogy of the river and water wheel showed how useful work could be done through the unbalance in the two channels. If the grid of the vacuum tube was inserted in the bridge in place of the galvanometer, then the degree of unbalance of the bridge would control the strength of the signal on the grid and would thus control the current from cathode to plate. The next article in this series will show how the bridge circuit and the vacuum tube can be combined to do the work wanted.

FHA Terms Eased

COMMISSIONER FRANKLIN D. RICHARDS, FHA, has announced he has notified all qualified private lending institutions that the 10 per cent cash down payment on Title I loans for repair and modernization has been eliminated. The formal amendment to this effect was signed by Commissioner Richards May 15th.

More than 5,900 lending institutions, together with 4,000 branches, under this change can resume normal lending practices with the removal of FHA's emergency 10 per cent down payment requirement on property improvement loans.

From FHA's inception in 1934 modernization and repair loans were made to borrowers by private lending institutions, under the FHA plan without down payment until April 20, 1948, when the 10 per cent down payment was instituted.

It is this section of the FHA insurance authority which makes possible the financing of the installation of heating equipment.

Crawl Spaces—Their Effect on Dwellings (II)

RALPH R. BRITTON
Washington, D. C.

This material is taken from a study published by the Housing and Home Finance Agency of the Federal Government. It appeared in Technical Bulletin No. 2, published by that agency. The problems posed by crawl spaces are thoroughly analyzed.

5. *With soils having fines in the vicinity of 50 to 80 per cent, the supply of moisture appears to be constant regardless of the depth of the water table.*

   Core borings were made and it was noted that no matter whether the water was 8 ft or 20 ft below the ground surface the same straight line relation betewen fines and natural moisture content near the surface held.

6. *Separate tests of evaporation of water from soils containing 56 per cent fines with a constant supply of water at a depth of 30 in. below the surface indicated that evaporation from the earth may run as high as 19 gallons of water per 24 hours per 1,000 sq ft.* The lowest observed amount was 8.7 while the highest was 19.1 gallons. The average was 12.1 gallons per 24 hours per 1,000 sq ft.

   This amount checks quite well with observed quantities of 32 to 45 gallons left in a structure of 3,000 sq ft floor area in 24 hours, as reported under No. 1 above.

   The 12.1 gallon average for soil may well be compared to 17.4 gallon average evaporation from free water under the same test conditions. It is quite probable that had the soil used in these test conditions been roughened up (instead of being smooth and tamped) the evaporation might well exceed that from free free water. We believe there will be general agreement that these figures are quite staggering and they will serve to emphasize the importance of the problem under discussion.

   Note: Conditions of this soil testing and a preliminary report on it are set forth in a previous issue of the Technical Bulletin No. 38.

7. In one wood frame project in the war housing survey, where crawl spaces were almost completely closed up the year round, sixteen first floors had rotted out in 4 years to the extent they had to be replaced. In six years it was necessary to either renew or make major repairs to all of the 200 living units. On this project the ground in the crawl spaces had been allowed to remain uneven to the extent that in many places dirt was observed in actual contact with the wood joists and girders. It was noted, however, that much of the rotted lumber was not at locations where dirt was in contact with it. A major cause of this needless costly repair job may well be attributed to unventilated and close-up crawl spaces.

   Figure 5 shows condition of rotted lumber described above. Here the building had settled down over a double 2 by 12 outside girder some 2 in. due to crumbling of the rotted wood. Note the rotted brace intended to support asbestos cement skirting at the left and the poor practice of driving it into the ground. Floor joists, although well above the ground, were equally rotted at some places. Corrective measures adopted included 6 sq ft of crawl space wall ventilation for each 2-bedroom living unit, creosoting of first-floor beams, and elimination of dirt and wood contact.

8. On one project in the Central States it was found that closed-up crawl spaces resulted in

Fig. 5

moisture contents in the wood as high as 50 per cent and the complete delamination and separation from framing members of a plywood soffit of stressed plywood construction. Here the plywood used was of the moisture resistant type, and the glue used for assembly of plywood to framing members was not a waterproof adhesive. In this instance materials used for the structural floor system *as assembled did not have a high wet/dry strength ratio.* High wet/dry strength ratio is associated with structural materials used in the past, namely, wood, steel, concrete.

Figure 6 shows the condition of the first-floor panels as the author found them after exposure to the conditions imposed by a tightly closed-up crawl space. The strength and rigidity contributed by the plywood has ceased to exist.

With the plywood contributing up to 75 per

Fig. 6

cent of the strength and stiffness of the floor panels there is no doubt that concern should exist when assemblies having low resistance to prolonged moisture are subjected to conditions such as the floor shown in Fig. 6.

In all fairness it should be understood that the trouble being discussed is not necessarily the fault of the materials. The conditions to which they have been subjected are the real cause of the trouble. As has been pointed out before, lumber, or steel would likewise have been expected to give trouble under similar exposure.

9. On other projects it was found that high humidity caused by moisture from the ground in enclosed crawl spaces (a) built up wood moisture contents to over 50 per cent (b) delaminated and softened up plywood flooring to the extent it acted more like a sheet of rubber than ½ in. rigid board it was intended to be, and (c) condensed on and in blanket insulation to the extent that the extra weight caused the blanket insulation to drop out from between the joists. In so doing it rested

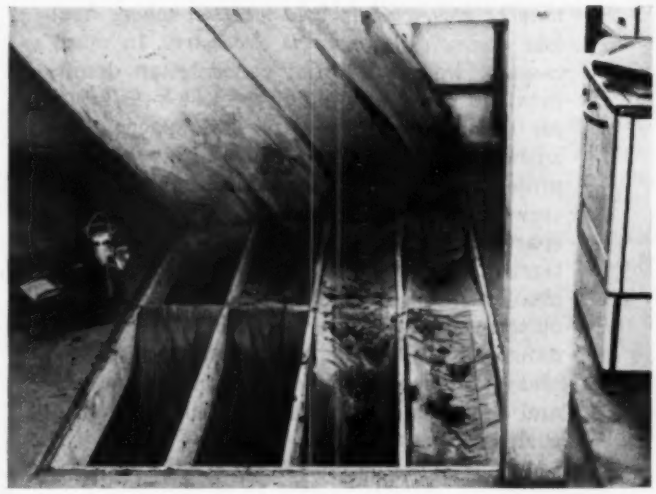


Fig. 7

on the ground and acted as a wick to bring up more moisture.

Figure 7 is illustrative of the conditions discussed above. It shows the exact condition of the insulation as found. In this instance the wisdom of closing the crawl spaces up tightly to save heat can well be questioned.

Figure 8 shows a feeble gesture at providing ventilation for the crawl space condition recorded on Fig. 7. Nine half-blocked 1⅜ in. round holes with encouragement to close them constituted the entire ventilation for a two-bedroom living unit. Good practice today (and at that time) indicates approximately five sq ft of free area ventilation for the 640 sq ft of crawl space area associated with each living unit.

10. *On still other projects delamination of plywood roof sheathing and condensation on nails through any kind of roof sheathing was directly traced to wet crawl space conditions where humid air was raised through thermal differences to cold inadequately ventilated roof surfaces.*
11. *In several cases it was found that job specifications stated that crawl space ventilation*

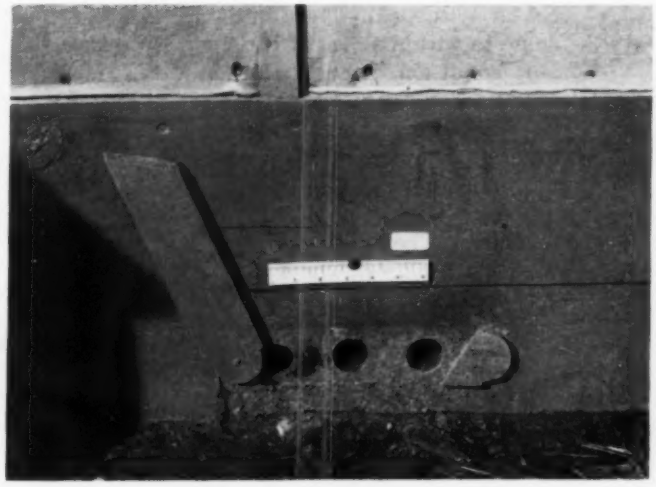


Fig. 8

may be closed up in cold weather where heat loss through the floor is excessive. In many cases it was found that construction details provided doors and slides to close ventilation for both crawl spaces and loft spaces. The author found that at many large housing projects routine duties of the maintenance crews included closing all ventilation in crawl spaces and attics (or loft spaces) during September or as soon as cold weather set in. In many instances ventilation was not opened up on termination of cold weather. The potential dangers in these practices should be apparent and it is hoped trouble experienced in the past and described in this article will discourage such practices.

12. Figure 9 shows paint failures opposite an enclosed and unventilated crawl space in a community building of a temporary housing project in Wisconsin. The large windows shown came to within 12 in. of the floor. Note excellent condition of the paint on siding above first floor while complete failure exists opposite the enclosed crawl space.

Fig. 9

13. Figure 10 shows paint failure where two houses originally designed as single dwellings were set some 6 in. apart. The crawl space was common. The roof extended uninterrupted over both houses. The 6 in. space acted as a flue conducting the warm humid air from the crawl space up to a trapped peak where it then dispersed through gable end ventilation back into the attic spaces. Here plywood roof sheathing was delaminated and other evidence of condensation was noted.

Figures 11 and 12 speak for themselves. They show conditions of the outer wall construction below the first floor after 3½ years of service. Insulation of these first-story and crawl space walls accelerated condensation of the warm humid air in back of them on the sheathing boards. Since insulation was installed in the walls and since there was evidence of infection in the lumber at the time of construction, the condition shown could have resulted from other causes than the damp crawl spaces. It was generally agreed by the technicians who inspected the project (which was of considerable size) that with the crawl spaces closed the trouble was definitely accelerated.

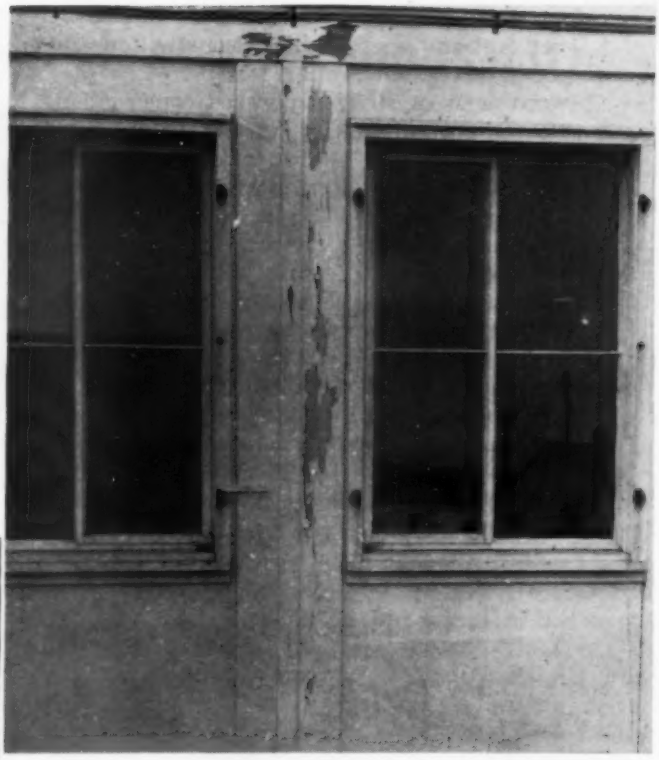


Fig. 10

14. *Although not definitely established, it is the opinion of the author that where the buildings*

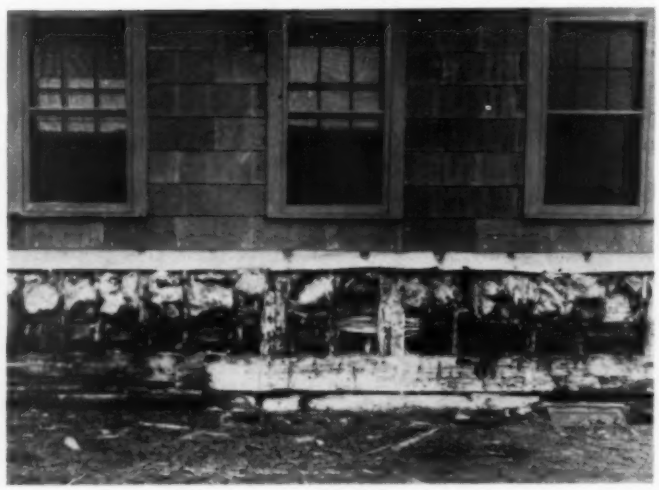


Fig. 11

Fig. 12

are located on a hillside site, and all other factors are comparable, crawl space conditions may be expected to be worse than on level ground. Incidentally, cost considerations on hillside sites tend to point to crawl space construction in lieu of slabs on the ground.

15. During the investigations on the 72-apartment project it was noted that certain buildings had experienced little trouble, although in some instances they were within 10 feet of buildings having much trouble.

    Investigations and tests revealed that for these buildings having little trouble the soil in the crawl spaces was of relatively low content in silt clay and colloids (fines). Apparently the high content of coarser materials greatly reduces capillarity and results in less water at the surface to be given off to the air. It is reasonable to believe, however, that soil in which capillarity is broken, due to a large percentage of coarse material, is the exception rather than the rule.

16. Preliminary tests under slightly controlled conditions of several suggested methods to reduce the source of moisture from the soil revealed some interesting and enlightening results. The following is an extract from a report on this subject previously made by the author.

    "Soil Evaporation Experiment

    Average air temperature—58 F

    Average relative humidity—69.7 per cent

    Average soil temperature—51.1 F

"(a) Evaporation from free water under the conconditions of the experiment vary from 12.42 to 23.0 gallons with an average of 17.4 gallons per 1,000 sq ft per 24 hours for four observations.

"(b) Evaporation from smooth untreated soil under the conditions of the experiment vary from 8.7 to 19.1 gallons with an average of 12.1 gallons per 1,000 sq ft per 24 hours for eight observations.

"(c) Evaporation from the calcium chloride—sodium silicate treated smooth soil under the conditions of the experiment vary from 7.8 to 9.25 gallons with an average of 8.23 gallons per 1,000 sq ft per 24 hours.

"(d) Evaporation from the Vinsol N.V.X. treated soil under the conditions of the experiment vary from 8.8 to 11.3 gallons with an average of 9.69 gallons per 1,000 sq ft per 24 hours for three observations.

"(e) Evaporation from the pea gravel treated soil (3 in. thick topping of ½ in. to ⅛ in. gravel) under the conditions of the experiment is showing a wide range. Here the variation is noted to be from 0.88 to 4.0 gallons with an average of 1.44 gallons per 1,000 sq ft per 24 hours for four observations.

"(f) Evaporation from the 55 lb heavy mineral surfaced roofing covered soil under the conditions of the experiment is .28 gallons per 1,000 sq ft per 24 hours for one observation.

"The pea gravel treatment and the 55 lb heavy roofing paper treatment are being tried out as covering for soil in crawl spaces of two buildings of 40 by 80 ft size. It is too early to draw conclusions but from visual observations the crawl spaces treated appear to be greatly benefited by each method. Costs are in favor of the 55 lb roofing. This roofing presents a uniform surface over rough grading with the edges conforming at the lap joints. The surface can readily be walked or crawled on without damage provided reasonable care is exercised. Durability of the roofing may be questioned. This material, however, has in other applications in and around Washington, D. C. performed quite satisfactorily for 4½ years with very little, if any, evidence of deterioration."

17. When ventilation was added to the walls of loft spaces of a test building of the 72-apartment project and, therefore, the suction effect of the roof ventilators to the crawl spaces was eliminated, it was noted that the crawl spaces rapidly became wetter and damper.

18. When ventilation to the extent of approximately 1/1500 of the building area was cut into crawl space walls, *in conjunction with* ventilation of approximately 1/500 of the building area in the loft space walls and the covering of the crawl space ground with 55 lb mineral surfaced roofing, all trouble was apparently eliminated. It is to be noted that these corrective measures are the one adopted for the entire 72-apartment project. They are apparently successful as no trouble during the winter has since been reported.

19. Consistent with the well-known fact that condensation does not often occur on warm surfaces, it was especially noted that in the vicinity of any heating lines located in the crawl spaces no evidence of condensation existed.

20. A point in design worthy of note is the following: It is common practice to provide entrance areas in multiple housing projects inside of the general building line. Such areas which

(Please turn to page 96)

Custom-Made Evaporative Cooling Systems Fit Individual Requirements

RUSSEL R. VOORHEES
Cleveland, Ohio

This contractor felt there was a need for exact sizing in the evaporative cooling field and his sales volume seems to bear out his contention. He claims that the added engineering effort is justified.

Photo at the right shows the discharge grilles on one of the Brownson installations.

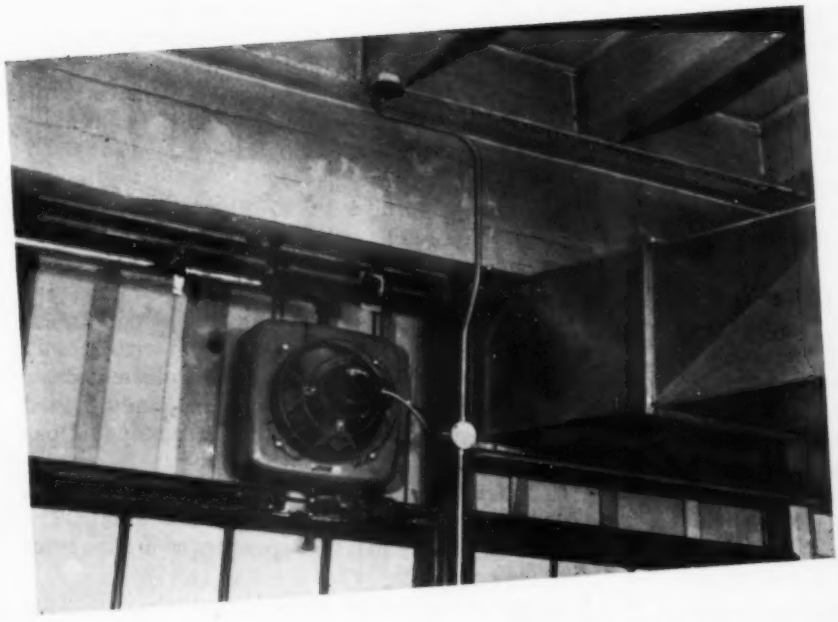
IN ALMOST every field of endeavor the modern trend is towards specialization. Knowing this fact, Gene Brownson, owner of Brownson Air Conditioning Co., Kansas City, Missouri, decided that he should pick a specialty in the field of air conditioning. The product that he decided to specialize in has become so popular in his city that his firm has all the business that it can handle without soliciting any more.

Mr. Brownson chose evaporative cooling as the phase of air conditioning in which to specialize and did so for one major reason. He had a theory that in cases where evaporative cooling had not been completely satisfactory the fault did not lie in the cooling method, but rather in the sizing of the equipment. In most cases, evaporative cooling is sold as a package job and very few units are available with a capacity greater than 10,000 cfm. Part of Mr. Brownson's theory was that many installations were undersized and that the way to surmount this difficulty was to design units tailored to the cooling requirements of the job. While it is possible to combine package units to arrive at a desired cooling capacity, installing two separate units to operate as one is not always satisfactory.

With his field of specialization determined and a decision made as to how he would approach the problem, Mr. Brownson set about selling some of the merchants of Kansas City on his theories about evaporative cooling. The sales resistance he encountered was considerable, but he had one potent sales weapon in the economy of this type of cooling and eventually the jobs started to come to him. Evaporative cooling installations average about one-fifth the cost of mechanical cooling jobs and this fact was emphasized fully in every sales contact.

Engineering Follows Sale

With his prospect sold on evaporative cooling, the Brownson theory could go into operation. Each job was completely engineered, from start to finish. A survey would be made to determine the cooling requirements and the cfm capacity needed and then the equipment selection would begin. Blowers and washers were selected to suit the individual job and it soon turned out that almost no two were alike. In some cases the unit would be made up of two washers and one blower, while most would have one washer and one



A view of the other side of the wall shown on the opposite page.

Duct shown leads to blower which is located in the shaft below the penthouse, on the roof.

blower, but the important thing was to have the equipment fit the cooling requirements. Another basic requirement in the engineering of his jobs is one air change per minute.

The grilles used for these custom installations are shop fabricated, since another of Mr. Brownson's theories was that the grille should be two to four times the width of the blower opening, for most efficient operation.

The penthouses used are also made to order so that actually the only parts of a Brownson installation which are purchased are the washers and blowers. Every other part of the job is tailored to the individual requirements.

Equipment Specifications

An idea of the equipment used in a fairly typical installation can be obtained from some specifications of a job installed in the Remington typewriter agency in Kansas City. This is pictured in the illustrations and the equipment included: one 42 in. blower driven by a 10 hp motor and one 40,000 cfm air washer. The grilles are 10 ft wide and 2 ft high. The system has been installed and operating long enough for the owner to declare his complete satisfaction with the comfort results.

While Mr. Brownson is an enthusiastic advocate of evaporative cooling he is also quick to state that it is not suited to universal application. He claims that the best results can only be obtained when the area to be cooled is an open unit of space with few obstructions. It is not completely suitable for jewelry stores, office buildings, men's wear stores, or banks where there may be numerous partitions. On the other hand, it seems to be a very fine method of cooling for theatres, night clubs, beauty shops, drug stores and similar places where there is a sizable open area without obstruction.

The Secret of Success

In analyzing the success of this firm in selling its air cooling units to Kansas City businessmen it will be observed that the best basic principles of salesmanship have governed the conduct of the business. The product selected was one which fills a definite need, cooling; only the best component parts were selected for use in the installations and each job was tailor-made and so by its nature had to function properly and efficiently. By choosing a good product, selling it to people who needed it on its own merits with no misrepresentation, this firm could not help but succeed.

New GAMA Unit Formed

FORMATION OF A NEW UNIT of the Gas Appliance Manufacturers Association was announced recently by Harold Massey, assistant managing director of group activities of the organization. It will be known as the Floor Furnace Group and its first chairman will be Lee A. Brand, of Belleville, Illinois. He is vice president of the Empire Stove Company.

Frank J. Nugent, of Cleveland, president of GAMA, appointed Mr. Brand after the new group had been activated at the annual meeting of the Association, held recently in Colorado Springs. Increasing interest in and the growing importance of gas operated floor furnaces resulted in the formation of the new unit which brings the number of divisions and groups in GAMA to 18, covering practically all phases of the industry.

The Floor Furnace Division will operate in conjunction with GAMA's Gas House Heating and Air Conditioning Equipment Division of which Frank L. Meyer, president of Meyer Furnace Company of Peoria, Illinois, is chairman.

furnish protection, shelter and space for mail boxes, are often unheated and they may have a floor temperature close to outside temperature. It has been noted that directly below such areas condensation trouble has been more pronounced than in other parts of crawl spaces. This is, of course, due to the fact that thermal resistivity of such floor construction is not designed sufficiently high to prevent cold under-floor surfaces.

Based on the experience of the author the conclusions are as follows:

1. Inadequate attention to treatment of crawl space floors and deficiencies in ventilation of crawl spaces have in the past been the sources of major condensation and deterioration trouble. They will continue to be unless the source of the trouble is appreciated and corrected.
2. Since data to date indicate total moisture from crawl spaces may be far in excess of that from normal living habits of occupants of dwellings and since equal amounts of ventilation are more effective in a loft space (less obstruction and more wind sweep), the crawl space should have more ventilation than the loft space.

   In the absence of special competent engineering data on a given project, the following may be expected to effectively guard against troubles like those reported above.

Crawl Spaces

Ventilation (free area) in crawl space walls equal to 2 sq ft per 100 ft of building perimeter plus .5 per cent of the building area should be installed and kept in operation.

Note: This amount allows for some depreciation in effectiveness of ventilating through (a) clogging of screens and (b) growth of shrubbery.

When the roof slope is more than 3 in. in 12 in. and there is no effective vapor barrier in the top story ceiling, install ventilation in the gable ends as high as possible with free access to all other enclosed spaces between the living quarters and the roof in the total amount of 1/300 (free area) of the reflected roof area.

When the roof slope is flat (less than 3 in. in 12 in.) and there is no effective vapor barrier in the top-story ceiling, and the ventilation is at the eave line or close to it, ventilation of not less than 1/150 (free area) of the reflected roof is recommended. All spaces in attic or loft space should, of course, be interconnected.

3. When relying on ventilation only for condensation control in the crawl space and the loft space, the floors over the crawl spaces and the ceilings under the loft or attic spaces should have good insulation properties against heat loss outward. Mechanical lines in ventilated crawl and loft spaces should also be insulated. Good practice recommendations on insulation are set forth in "Performance Standards," a recent publication of the Housing and Home Finance Agency.
4. Loft or attic spaces *should not be ventilated through the roof only.* It is understood that existing building codes and even Model Basic Codes now being written are not clear on this subject and are being interpreted to prohibit ventilation in side walls of loft spaces. Such practice is dangerous.
5. Attention is directed to other possibilities in guarding effectively against prolonged condensation. Crawl spaces may be vented by ducts through the roof, opening directly into the crawl space below the first floor. Treatments of soil other than covering with roofing in crawl spaces show promise. Sufficient data, however, have not been gathered and analyzed as yet to allow good practice recommendations to be set forth on their use.
6. Trouble should not be invited by providing closing devices for needed ventilation. The closing of ventilation openings is a dangerous practice.
7. For crawl space construction the following good practice requirements for taking care of matters other than the condensation problem under discussion are, of course, still recommended:
   (a) Adequate headroom for the purpose of maintenance of equipment.
   (b) Proper slope of outside grading away from the building.
   (c) Possible drains in the crawl space if the floors are below outside grade and of a soil composition not allowing seepage through it of water finding its way to such low places.
   (d) Full eighteen-inch clearance between ground and bottoms of wood framing or other material subject to attack by termites.
   (e) Ready access to all parts of crawl spaces for inspection against deterioration and termites.

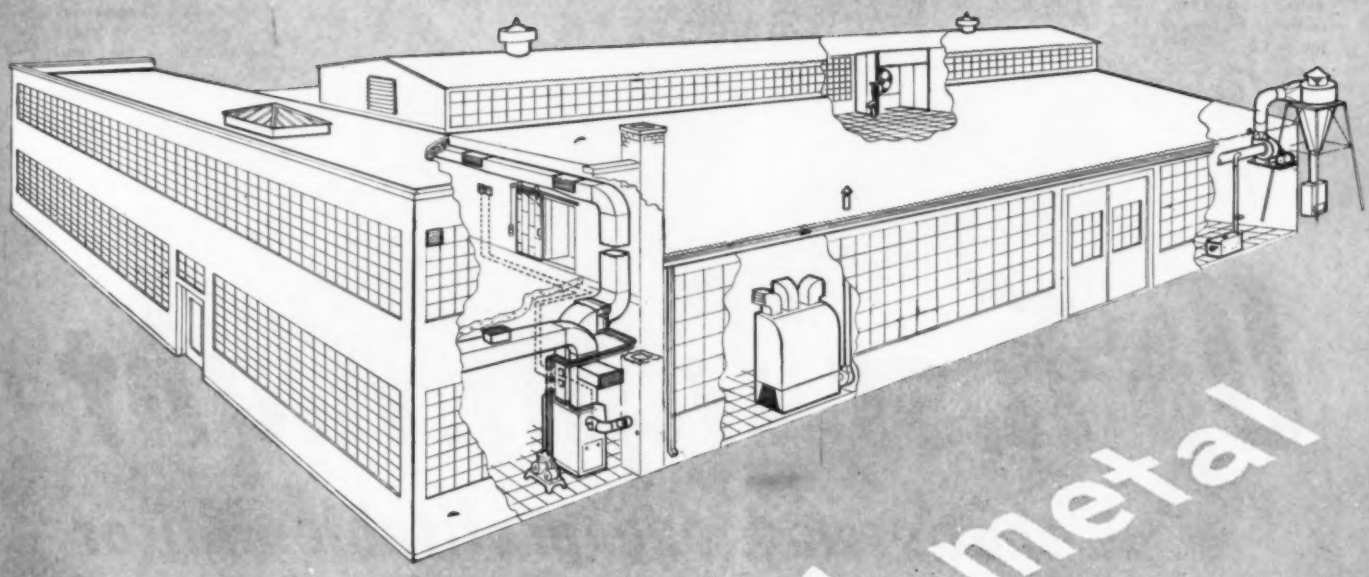
Conclusion

As more data are developed it is hoped that readily understood and applicable functional requirements for crawl space design may be developed. Such a functional requirement may well be substantially the following:

> "The design shall be such as to reasonably assure lack of prolonged condensation on any surface either exposed or enclosed (and including equipment) of any part of the dwelling or building."

We are reasonably sure of one way of accomplishing the desired result. That is by adequate ventilation as described above. However, as we go ahead in development, other means of doing the job adequately are bound to be perfected.

It is hoped that the experience data and recommendations set forth above will be helpful in creating a better understanding of the effect crawl spaces may have on dwellings and other buildings. It is also hoped that they will result in more adequate and complete recognition of the problem by architects, engineers and builders as shown in future plans and specifications.



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A LIGHT source adds two types of heat in an interior where it is employed. The two types of heat are *sensible* and *radiant* heat. The former is that which is added directly to the air through conduction or convection. It shows up in a rise of room temperature as registered on the thermometer. The latter, *radiant* heat, is that which is added by energy *radiation*. This type of heat turns into sensible heat only as it is intercepted by such objects as furniture and the human body. Only to a minor degree does it raise air temperature.

Thus, since any light source adds to the total heat in an interior,* there is an evident and important rela-

* *To the extent of 3.414 Btu per hour per watt of power consumed. Tons of air conditioning = Btu per hour /12,000*

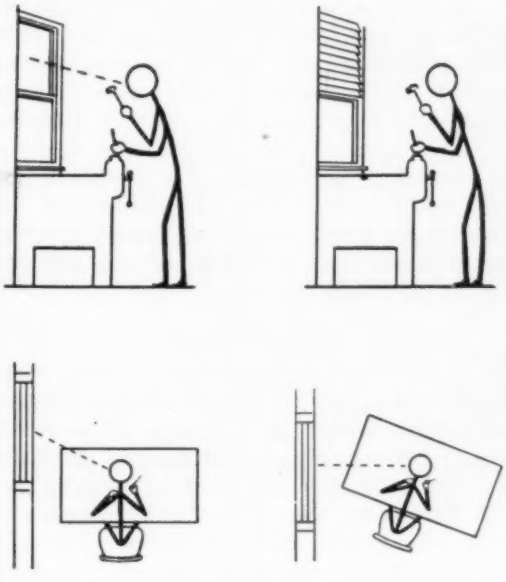
This plate printing department of a Canadian bank note company requires 50 foot-candles at all working locations.

Requirement for this machine shop was 30 foot-candles and 85 watt, two-lamp industrial units provide it.

tion between lighting and room temperature and room comfort. The room comfort is not necessarily related to the room temperature. However, it is the comfort objective of air conditioning that makes consideration of heat, either sensible or radiant, a key factor in the ultimate result.

A fact to be remembered in this connection is that light sources produce invisible radiant energy as well as light. Wavelengths in the ultraviolet and infrared ranges are absorbed or reflected to a varying degree by the human skin. Window glass absorbs most of the ultraviolet energy which might affect our comfort in our homes and offices and factories. It does admit, however, enough infrared radiation to make a problem

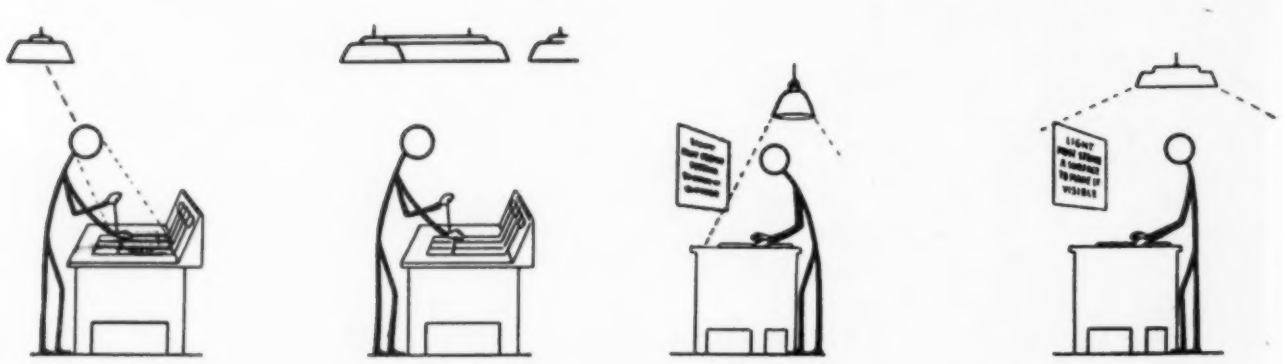
High bay foundry lighting system uses 5 lamp clusters of 300 watt bulbs.



Here a grid system of 40 watt fluorescent lamps delivers 80 foot-candles. One of the best systems for high level illumination.

in sensible heat. Where controlled conditions are desired in an interior, windowless buildings eliminate the difficulty of temperature rise (or loss) through windows. Controlled conditions imply a careful calculation of the energy distribution in the illuminant chosen.

Confusion is sometimes expressed at the assertion that fluorescent lamps produce cooler footcandles than do incandescent lamps. While a kilowatt-hour represents an over-all heating effect of 3414 Btu regardless of how consumed, the lesser sensation of heat from fluorescent lamps lies in the fact that (1) they generate more lumens per watt of energy consumed than do filament lamps, and (2) less radiant energy is emitted



than by filament lamps of the same wattage. Both of these factors are evaluated when light sources are compared on a "total radiant energy per lumen" basis. The total radiant energy (light plus radiated heat) for a 40-watt white fluorescent lamp is 18.8 watts or 8.7 watts per 1000 lumens. Comparable values for a 200-watt general service incandescent lamp are 160 watts radiated or 43 watts per 1000 lumens. Thus it is said that the sensation of heat from fluorescent lamps is only about one-fifth that from filament lamps for the same amount of light delivered. The difference, registered on the forehead of a workman may, under certain circumstances, be a factor of significant proportions.

Light Affects Comfort

Psychological reactions produced by the spectral quality of an illuminant are likely to vary with the amount of illumination and the reflectance characteristics of the larger surface areas in a given room. Thus, the cool effect of daylight fluorescent systems, used in conjunction with a decorative scheme, largely in blues and greens (cool colors), may be heightened with a rise in the illumination level. Conversely, a room lighted with the "warmer" quality of filament systems (or fluorescent with similar energy distribution), will accentuate this impression with a rise in footcandles if the decorative scheme is in reds or yellows. Balancing the quality and quantity of illumination with a decorative scheme should be undertaken with reference to seasonal or climatological conditions and the overall importance of seeing comfort.

Since the human body regulates its temperature by skin evaporation as well as by radiation and convection, and since the rate of evaporation depends upon humidity of the air, the sensation of heat as registered in terms of comfort depends upon air water control as well as absolute temperature.

Refinements implicit in the resources now available to the architect or construction engineer in creating optimum comfort conditions in modern interiors stress flexibility. Many factors must be brought into mutual support, not in a rigidly fixed relationship, but in a way wherein the complexities of comfort and efficiency may be agreeably harmonized. Not only for winter and summer, but for the subtleties that lie between day and night and rain or shine.

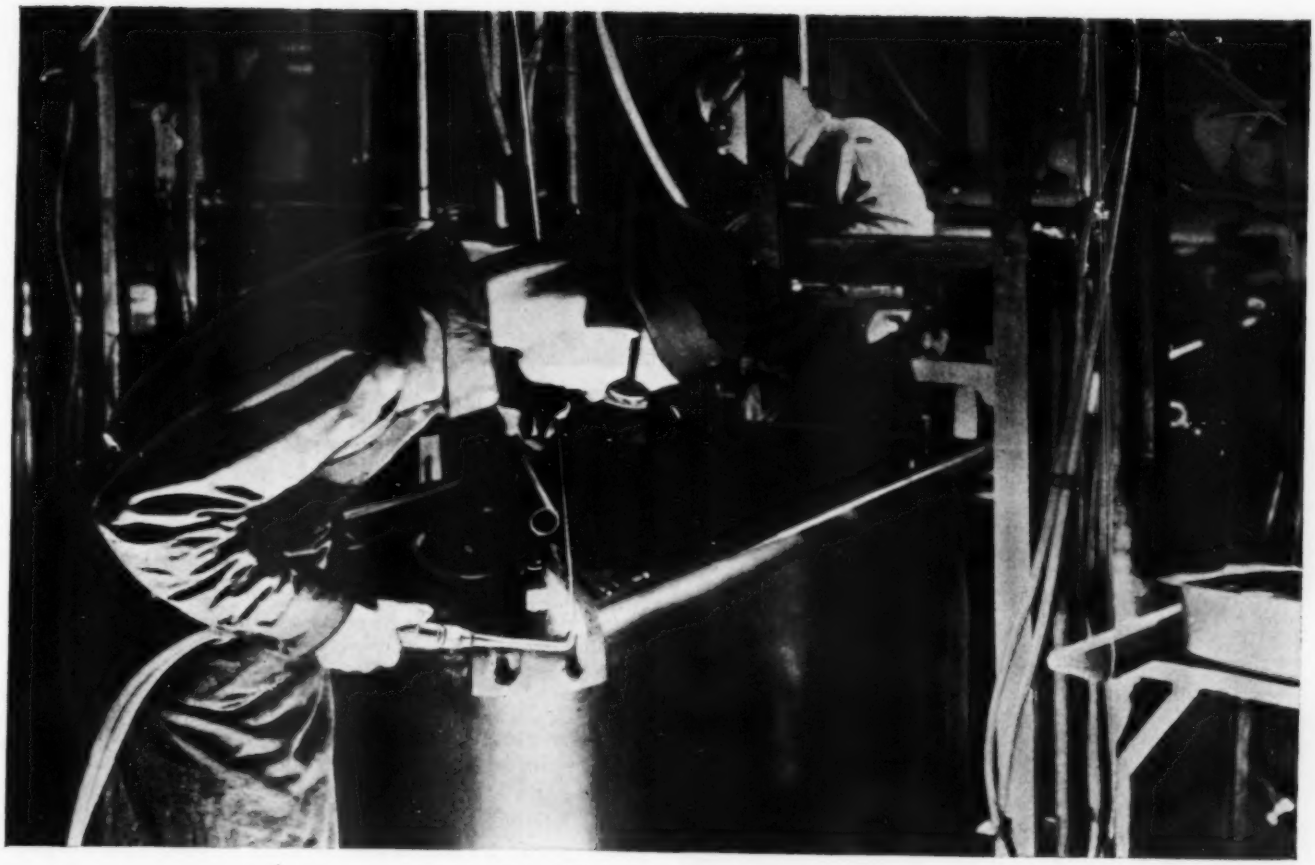
Physical Factors and Human Efficiency

Workers and machinery are interrelated in any modern manufacturing plant, one is of little use without the other. The plant itself, not necessarily modern because the machinery is new, is up-to-date, insofar as it provides the environment in which the personnel can operate the machinery to the best advantage. Machinery tends to depreciate over a period of use. Manpower, properly supervised, tends to improve in skill, which factor of added potential can be drawn on relative to plant conditions. Environment, the complex resultant of many factors, is seldom developed as fully as it might be to produce the maximum benefits available. Lighting, room temperature and relative humidity, ventilation, general plant appearance, all add up, with other factors, to make environment. In a good combination, they satisfy those overall psychological requirements that are basic to the efficient employment of plant and personnel.

Sight Is Vital to Industry

Think of the tremendous importance of sight. Most jobs in industry are largely seeing tasks. Thus, although the skilled pattern worker may be able to check his work by running his sensitive fingertips over the wood surface, he must ultimately use his sight to make certain the job follows the blueprint. The lathe operator can tell when the proper diameter has been reached by the feel of the micrometer as it slides over the work in the chuck. But he must see to set the micrometer and adjust the cutting. Reading blueprints or gauges are good examples of typical critical seeing tasks which deserve the best lighting.

Modern industrial techniques take account of the power of team spirit. If a worker *feels* that the physical environment factors work with him he can *see* his way towards making his efforts fully effective. Good plant atmosphere kept at daily high standards by good plant housekeeping, is the background for team work.



Here welding cuts costs and time.

How To Weld Sheet Steel

The welding of sheet steel has become one of the most important steps in fabrication. There are some methods of procedure which assure a good finished product that all our readers may not be familiar with. This discussion is aimed at improving the quality of the welds made in sheet steel.

BEFORE starting to weld sheet steel the most important step is to clean the sheet edges. Then select a light-duty blowpipe with a head recommended by the manufacturer, for the thickness of metal you are going to weld. Sheet steel, material up to ⅛ in. in thickness, usually requires no special edge preparation. On most jobs, complete penetration can be obtained by properly spacing the pieces of sheet to be welded.

Place the pieces of sheet steel to be welded on the welding table. Space them about 1/16 in. apart at the

An excerpt from *Linde Tips*

right end of the seam and about ⅛ in. apart at the left end as shown in Fig. 1. (This applies only to material up to ⅛ in. in thickness.) These figures are for sheet 12 in. long. It is important to keep a space between the two pieces of sheet for two reasons. First, the spacing allows the metal to expand. If the spacing is too small the sheets will soon butt together and may even overlap. Of course, this would make it almost impossible to weld. Second, this small space allows you to melt the edges of the metal all the way to the bottom and obtain complete penetration.

Here's a general rule to remember when the material is more than 12 in. long. A space of 1/16 in. should be maintained 12 in. ahead of the weld for the entire length of the seam. To keep this proper spacing an H-type clamp that can be moved along as the welding progresses will probably be required.

Tack-Welds

To keep the proper spacing between the two pieces of sheet metal, it is a good idea to tack-weld the ends of the seams before welding. To make a tack-weld, hold

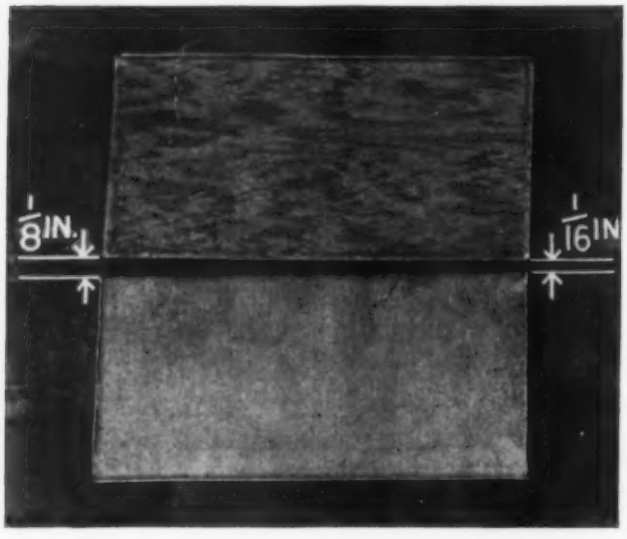


Fig. 1—Space the sheets about 1/16 in. apart at the right end of the seam, and about ⅛ in. apart at the left end. The space allows for the expansion of the metal during welding.

the lighted blowpipe and the rod as shown in Fig. 2. This is also the proper rod and blowpipe position for welding. Hold the blowpipe steady so that the flame will play upon the two corners at the right end of the seam. (These instructions are for right-handed welders.) Keep the edge of the welding rod in the outer part of the flame envelope. This will make it possible to bring the rod to the proper temperature at the same time that the spot on the sheet is at the melting point.

Just as two small spots of molten metal begin to form on these corners, add some molten metal from the welding rod. It will form a bridge between the two small puddles. Continue to play the flame upon this puddle, melting metal from the two corners and adding metal from the welding rod until the puddle has reached a diameter of about 5/16 to ⅜ inch. Then allow the puddle to cool and solidify. Now, make certain that

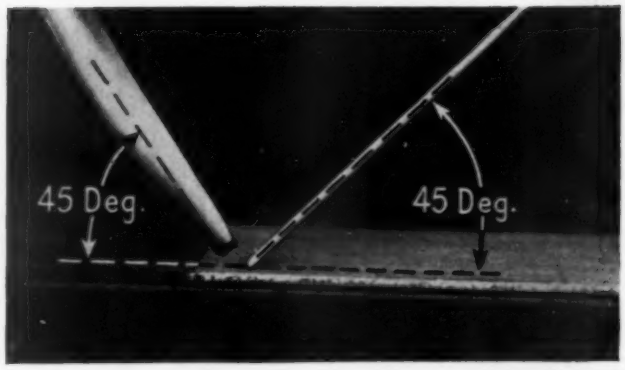


Fig. 2—This is the proper position for welding. Notice that the angle between the blowpipe and the surface, and the welding rod and the surface, is 45 degrees.

the spacing between the two sheets is correct and that they are flat and even. Then make a tack-weld at the other end. When the two tack-welds are completed, place the two sheets so that the narrow space is at the right edge of the sheets as shown in Fig. 3.

Butt Welds

Next step is the weld itself. Place the sheet so that the seam will come over an opening in the table. If the table top is solid, place a piece of welding rod under the left end of the two sheets. If the sheet is flexible it may need more than one piece of rod. This provides an air-space so that the weld and table top do not touch.

Play the flame upon the tack-weld at the right and re-melt a small puddle on the surface. At the same time, hold the end of the rod within the outer envelope of the flame without actually melting it. When the tack-weld starts to melt, add metal from the welding

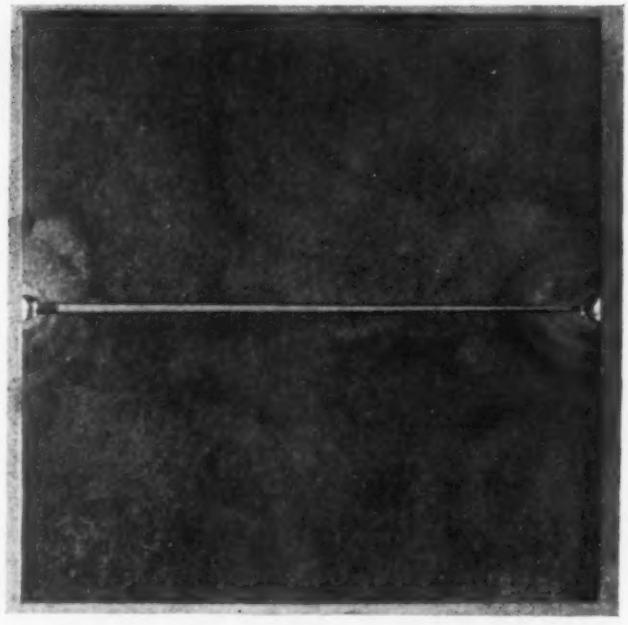


Fig. 3—Tack-welds at each end of the seam keep the proper spacing between the sheets. To make a tack-weld, heat the corners of both sheets. Allow the edges to break down slightly and flow together. Then add metal from the welding rod until you form a puddle about 3/16 to ¼ in. in diameter.

rod to increase the size of the puddle. As the puddle becomes larger and hotter, the proper penetration will result. The puddle must not get too hot or the bottom will drop out and leave a hole. Build up the puddle a little above the top surface of the sheet. Keep the molten puddle ¼ in. in diameter, and move both the blowpipe and rod forward in a straight line across the sheet. The flame should move from side to side so that it is first on the edge of one sheet and then on the edge of the other. This will bring them both to the proper welding temperature at the same time.

Keep the Rod and Blowpipe in Motion

While welding, the rod and the blowpipe must also be raised and lowered as shown in Fig. 4. Notice that when the rod is raised out of the way, the flame heats and melts the sheet ahead of the bead and forms a puddle. When the rod is lowered and placed in this puddle the flame melts the end of the rod, and the weld

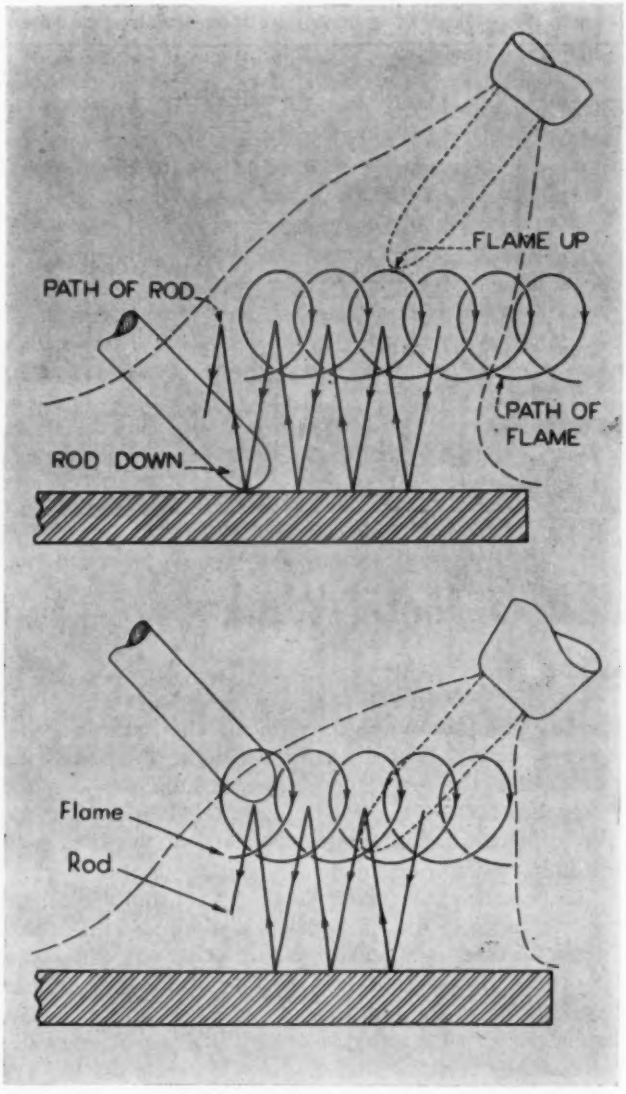


Fig. 4—The rod and blowpipe must be raised and lowered during welding. The top sketch shows the position of the rod and the tip when the rod is raised. Now the flame is heating the metal ahead of the weld. The lower sketch shows the position of the rod and tip when rod metal is added to the weld.

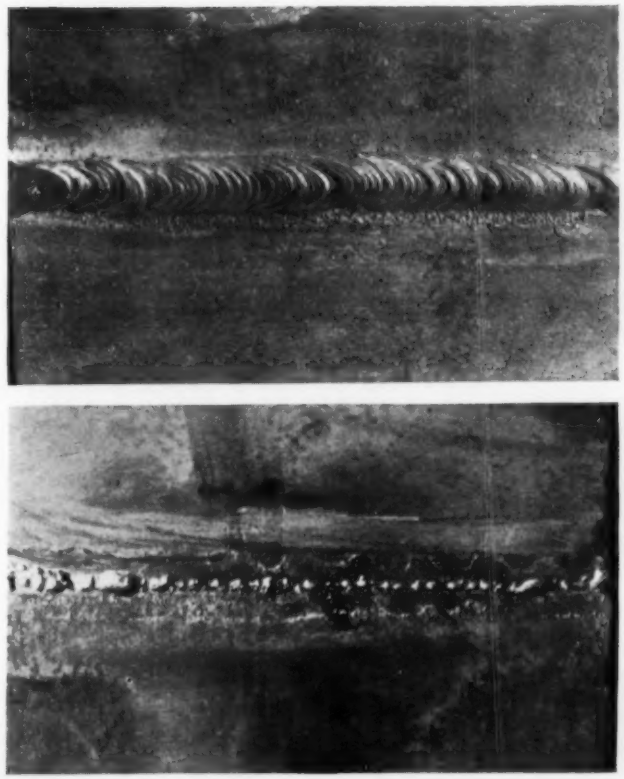


Fig. 5—The top picture shows the top surface of a good butt weld in sheet. The underside of the same weld is shown in the lower picture. Notice that the weld penetrates completely through the sheets.

metal flows into the molten puddle. Don't allow molten metal from the rod to drop into the welding puddle, but lower the end of the rod into the puddle to add metal. If the rod sticks to the weld don't try to jerk it loose. Simply play the blowpipe flame directly on the end of the rod and it will quickly come free. Usually, the rod will stick only if it is cold and has not been heated in the flame or if the puddle is not in the proper condition.

Two things should be watched closely. As the molten metal from the welding rod mixes with the edges of the sheet steel, these edges should be molten and in puddle form. They should be in this condition all the way through to the underside of the sheet because this is the only way to get complete penetration.

The other thing to watch is the build up of the weld. It should be higher than the surface of the sheet. This can be done only by adding sufficient welding rod metal to the rear of the puddle.

Hold the blowpipe lightly so that it can be guided smoothly without jerks or without fatigue.

Flange Welds

The flange weld can be used frequently in sheet metal work. No welding rod needs to be added to make this weld. The metal required is furnished by the part of the base metal that has been turned up.

Place the two pieces of sheet on the welding table with the flanged edges just touching. Use clamps to prevent them from separating. The flanged strip can be made by hammering over the edge while the sheet is in a vise. It should be as wide as the sheet is thick.

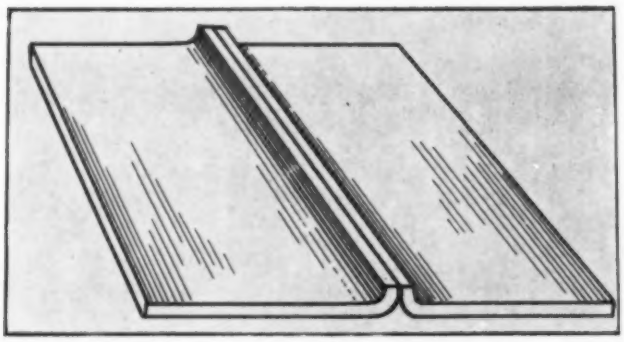


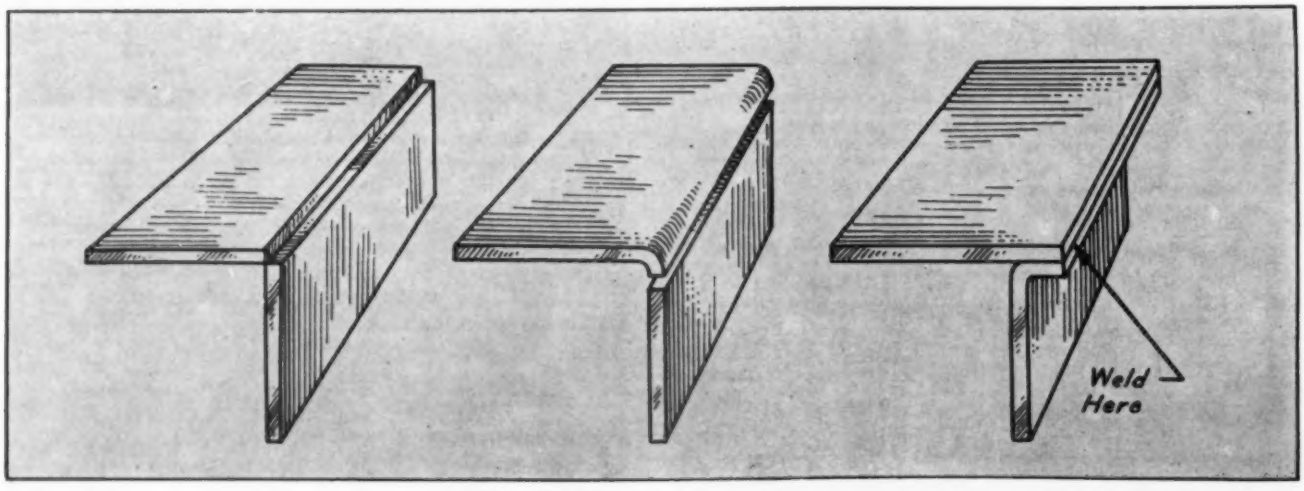
Fig. 6—To make a flange weld, turn up the base metal like this. No welding rod is added to a joint of this type. Clamp the pieces so that their edges touch.

Play the blowpipe flame on the right end until a small puddle begins to form. Increase the size of the puddle so that complete penetration is obtained. Then move the blowpipe along the seam slowly and steadily, always making sure that the puddle is hot enough to give good penetration. When the flanges melt there will be a built-up surface of the proper strength.

When two pieces of sheet metal are joined at a corner use either of the three common designs shown in Fig. 7. To make a joint like the left-hand sketch, the two edges must be clamped together while tack-welds are made every 4 inches. Then proceed to weld as for a butt weld. To make a joint like the one shown in the center sketch keep a small space about $\frac{1}{32}$ or $\frac{1}{16}$ in., between the sheets. Then tack-weld every 3 or 4 in. before making the final weld.

When making flange welds like the one shown in the right-hand sketch, the edges are held together by clamps. Visible penetration is not made. Pass the blowpipe steadily along the edges and allow the metal to melt. It will flow together and form a sort of bridge of molten metal across the two edges.

Fig. 7—Here are three common designs for corner welds. Welds in the left and center sketch are made like ordinary butt welds. The right-hand sketch is an ordinary flange joint.



Candy Making Needs Sheet Metal Work

R. C. NASON

ONE of the most profitable sources of business for the sheet metal contractor is the candy factory which produces various types of chocolate covered confections. Air conditioning is a fundamental need in such a plant and there are also cooling tunnels, work tables, racks, pans and many other pieces of equipment which require the hand of the skilled sheet metal worker.

Production of chocolate candies used to drop off to almost zero in the old days before mechanical cooling was available, but, now that it is possible to control completely indoor temperature and humidity, candy is made all summer. Were it not for cooling, the chocolates would show signs of premature graying, would lack surface luster, rapidly become hard and stale and suffer from surface cracks. Nut-filled candies would assault the tongue with a moldy, sour taste that would hardly contribute to demand for the product.

These troubles would begin in the "starch room" where candy centers are moulded. They are also brought to the proper conditions of humidity and temperature for coating with chocolate. This moulding is done in metal cavity moulds where sufficient stiffness is imparted to permit chocolate dipping.

This process is referred to as "enrobing," in the candy industry. As already indicated the atmospheric conditions must be exactly right or defects will appear in the finished product. It seems that the optimum conditions are a temperature of 65 F and a relative humidity of 50 per cent.

Another method of candy making calls for the production of the exterior chocolate shells in a moulding machine which makes them of uniform shape and thickness. The next step is the insertion of the filling into these shells. The filling has to be in a semi-liquid or plastic condition; after it is inserted, the chocolate

bottom is added by hand or machine to complete the operation.

The fillings are generally kept at a temperature slightly lower than 100 F. In the chocolate enrobing process, the chocolate is maintained at a temperature of 90 to 92 F. When the chocolates are hand-dipped, the women doing the dipping are seated on either side of a long table with cutouts for each worker. Each one has an electric chocolate warmer of her own, and the sheet metal contractor for the plant we visited, Consolidated Ventilation and Duct Co., of Long Island City, New York, made all these electric devices. Consolidated also handled the rest of the sheet metal work, as well as the necessary air conditioning.

After enrobing, the chocolates are cooled to 65 F at 50 per cent relative humidity; the moulds are cooled simultaneously for ease in handling and ready removal of the candy. Cooling is done in special tunnels with the product on moving conveyor belts. The tunnels are about 35 ft long and the air is supplied at 55 F. One such cooling tunnel for moulds can be seen in the illustration, with a side section removed. Each side is made up of these sections, each 4 ft long.

In the cooling tunnels for the candy moulds, the cooled air enters with the moulds and progresses the length of the tunnel and then is drawn off near the end and passed through a filter and cooled again for recirculation. The air is filtered because of the frequent presence of microfine materials which are dusted in the mould cavities to prevent sticking.

The air flow is reversed in the tunnels which are used to cool the enrobed chocolates. The tunnel itself is about the same as the other type but the cooled air is introduced at the exit end. In this way the air gains in temperature as it progresses toward the point where the candy enters the tunnel. The result is that the thermal shock to the warm candy is considerably diminished and flaws are prevented.

The sheet metal contractor made these electric chocolate warmers.

The cooling tunnel described in the text.

It is rather clearly evident that the candy maker is a good prospect for air conditioning because of the demands of his business. Consolidated Ventilation has stated that while the air conditioning market in a candy plant is a good one there are many other phases of sheet metal work that are required. For the plant which we visited the contractor made a number of work tables used for hand dipping and packing chocolates. These tables were made 80 ft long and 3 ft wide and then sheathed with aluminum. In addition to the tables other products required included carts, racks, waste cans, containers, chocolate heaters, cauldron covers and other work which totaled 250 tons of sheet metal in this one factory.

The air distribution system in this candy plant includes both ceiling diffusers and grilles. Trunk ducts at the ceiling are used and the grilles are applied where a longer throw is needed to supply the far corners of the rooms.

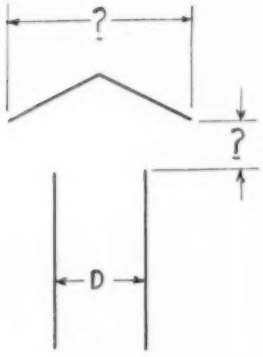
The Cooling Load

Operations in this plant are such that the lighting must be above average and this factor helps to build up the cooling load. Another important factor is the high occupancy rate. Largest concentration of employees is to be found on the floors where the hand dipping and packaging are done. The manufacturer has found that the women working on these jobs are very sensitive to discomfort and they must be kept comfortable to maintain the staff intact. This particular company produces 40,000 lb of chocolates daily.

Total cooling load of the plant has been calculated at 210 tons and the manufacturer specified the installation of several smaller units rather than a central unit of sufficient capacity. One 60 ton unit handles the first and second floors; there are two 40 ton units for the third floor; one 30 ton for the fourth and two 20 ton units for the fifth floor. The product damage that would result from a breakdown would be so costly that there are standby motors and compressors for all units.

The candy factory is by no means unique in its requirement of sheet metal work. There are many industrial plants which have a large and continuing need for the products of the sheet metal contractor.

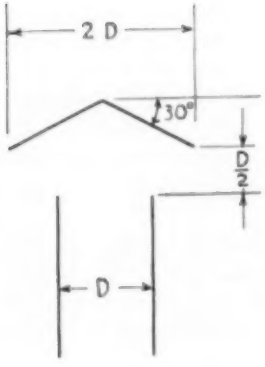
Readers Send Chimney Cap Designs



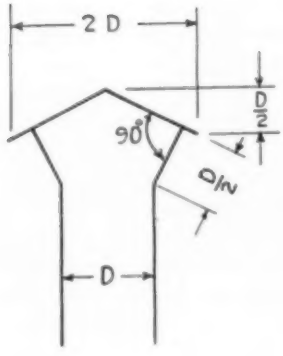
THE PROBLEM

IN THE March, 1949, issue of AMERICAN ARTISAN there appeared in the EDITOR'S NOTEBOOK a letter from Ralph J. Burr of Standish, Michigan, asking for a usable formula for determining the dimensions of chimney caps. The drawing at the left indicates the problem as he stated it, and he said that he needed the information for ventilators ranging in size from 5 in. dia to 36 in. dia.

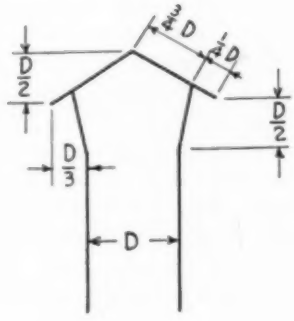
The response to this appeal was rapid and gratifying. On this page are some of the replies received from our readers. Our thanks to all of them for their keen interest.



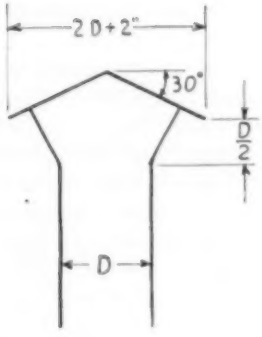
J. J. HASSON
READING, VERMONT



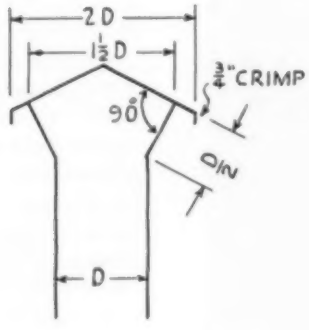
J. H. MONSON
DENVER, COLORADO



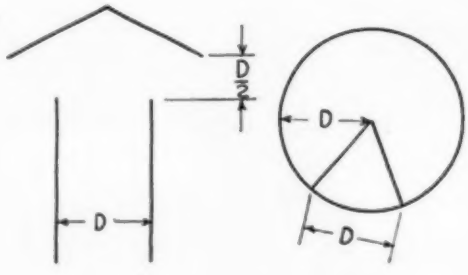
D. L. FRANCK
AUDOBON, IOWA



W. M. BELLMAN
READING, PENNSYLVANIA



C. A. KOPP
ALBANY, CALIFORNIA



A. C. POLSTON
LOUISVILLE, KENTUCKY

Clad Sheets—What They Are How They Are Used

Fabrication and Finishlng

Part 3 of a Series

RICK MANSELL
Process Engineer
Los Angeles, California

TO OBTAIN the maximum corrosion resistance from stainless steel surfaces care has to be consistently exercised to prevent contamination. The plates should be stored in clean dry surroundings. Clad steels are carefully inspected and wrapped at the mill before shipping—it then becomes the responsibility of the fabricator to protect the surfaces.

Plate surfaces are not as smooth as those of sheet and strip and hence are more liable to attract and absorb foreign materials. It pays to protect them as much as possible, then they will be easier to clean when the fabrication processes are completed. Layout areas should be kept clean to prevent soiling from floor dirt, grease, and lubricating oils from overhead structures.

Bending rolls and presses and their tool surfaces, grinding wheels and the contacting areas of equipment should be checked for cleanliness before any contact with stainless steel surfaces. Surfaces on such fabricating equipment as rolls and brakes should be checked for smoothness and all the irregularities removed. In this way undesirable tool marks and impressions will not be transmitted onto the stainless surfaces. Bending rolls, dies and tools should be brushed clean of loose scale and steel particles which otherwise might be embedded in the clad surface.

The emphasis on cleanliness is far more important in stainless steel fabrication than is the case with carbon steel. Plates should be handled around the shop with the clad side up to prevent gouging and deep scratching. Care must be taken in pickling, grinding, polishing and flux-removal operations to avoid penetration of the cladding. Any embedded foreign matter and deep scratches not only reduce the cladding thickness, but also may act as a focal point for corrosion.

For these reasons, care has to be exercised in the handling, both before and during the fabrication processes. Some mills furnish polished sheets with kraft paper protection covering the surfaces; alternately a protective paper coating may be applied to the clad surface by the fabricator using paste solutions to provide adherence. A plastic coating may be sprayed onto the surface, this can be subsequently peeled off in a convenient manner.

If welding is required, it will be necessary to remove a strip from 1 to 3 in. wide, of the paper or plastic along the edge to be welded. If attachments are to be welded on the reverse side the plastic coating should also be removed from the clad surface to prevent burning.

Points to watch in the handling of clad steels are similar to those encountered with stainless steel in the solid form. But it is to be noted that when one side is carbon steel, it is best to avoid stacking or handling the composite plates in such a manner as to cause contact between the stainless steel surfaces and the steel backing surface.

Mechanical Cutting of Clad Steels

Clad steels can be cut by the usual mechanical methods. Straight, circle, or template shears may be employed as well as abrasive disc cutters and the steels may also be edge-bevelled. It is best to perform these operations with the stainless steel on the top side to avoid drag lines and scratches on that side. The burrs are restricted to the backing side. When shearing is required, special care should be taken to select a stainless steel which sustains cutting all the way through and does not break away after a partial cut.

Shearing along straight and circular lines or to the template outlines, is the same as with carbon steel, except that the characteristics of stainless steels require more power and heavier equipment. The chromium nickel grades in the annealed condition do not spring apart after the shearing has progressed a certain distance through the cut, they have to be cut all the way through. Sharp knives which are closely adjusted are used for the work. Dull knives and incorrectly set clearances allow the metal to bend over and crowd the gap. Then as the chrome-nickel plate work

It has been observed that the clad steels are more easily polished than the solid steels. The softness of the cladding, after processing contributes to this fact.

hardens, severe stresses may lead to damage of the equipment.

High Temperature Cutting of Clad Steels

High temperature cutting operations include gas cutting with the modified oxy-acetylene flame, and metal lic arc cutting with hollow electrodes carrying a stream of oxygen. The air-hardening steels tend to become hard along the new edge as they cool from the high temperature of the cut. Some of the steels will be oxidized more or less according to their nature.

The heat of the cutting process will cause the unstabilized chromium-nickel types to develop carbide precipitation along the borders of the cut. These border zones undergo a potential loss of corrosion resistance—the condition is remedied by an overall annealing and quick cooling.

The border zones along the line of cut can be removed by machining, if it is not convenient to anneal. The width of the affected zones will depend upon the actual analysis of the stainless steel, the speed of cuts and the thickness of the plate. For example, in the type 304 plate 3/8 in. thick, it may approach 3/16 in. while in a 1 in. thick plate it may be 7/16 in. in width. It is always desirable to check this condition by cutting samples prior to actual production cutting.

To avoid the complications involved in carbide precipitation, it is best to select stabilized steels which are immune to harmful carbides. Nickel-clad, straight chromium, austenitic chromium-nickel clads are readily cut without any complications. At times some difficulty is experienced in the flame cutting of Monel and Inconel clad steels. The general practice is to preheat these two materials to a dull red heat in advance of the cut.

The flame cutting of steel involves the successive oxidation of the white hot metal and the removal of the oxide in the form of slag—this flows away or is blown out. However, in the case of clad steels, the cladding must be removed by the actual melting of the alloy, and the erosion, scrubbing, or washing effect of the stream of slag and oxygen.

The material is cut with the backing steel on top, and all the scale should be removed along the line of cut. The nozzle should be one or two sizes larger than that ordinarily used for the same gauge of steel. Best results are obtained with a nozzle with six preheating orifices rather than with the usual four. An ample volume of cutting oxygen should be provided to assist in the washing action. The torch should be inclined 5 to 20 deg toward the direction of the cut, so as to aid in production of slag which washes the cladding material away from the line of cut.

Preheat should be used at the start of all cuts, with the exception of 10 per cent cladding, in gauges up to and including ¼ in. With these lighter gauges it is only necessary to preheat locally with the cutting tip before commencing the cut. In heavier gauges, and also in the lighter gauges of 20 per cent cladding, it is recommended that the start of the cut be preheated, using a regular torch. Care should be taken to see that the preheating flame does not interfere with the fluxing action of the steel on the cladding.

Fabricating with Clad Steels

Clad steels are more easily fabricated with standard

metal working machinery than solid stainless steel. This is due to the existence of the soft steel backing which constitutes, in general, about 80 per cent of the total thickness. They can be worked, either hot or cold, and withstand the usual shearing, bending, rolling, dishing, flanging and drawing operations.

Normal fabrication and forming operations do not require stress relieving after completion. However, after hot forming or very severe cold forming operations, it may be advisable to subject the material to an annealing process in order to relieve stresses and increase the corrosion resistance.

Shearing, punching and drilling should be done with the clad side up so as to throw the burr on the steel side. If the sheared clad plates are to be welded, consideration should be given to the shear droop—this is the break in flatness that occurs on the sheared edge resulting from the exerted pressure. This shear droop is disregarded if the plate edge is subjected to subsequent machining operations, or if the plate is of light gauge.

When the fabricator shears sheets or plates for metallic arc welding, and the welds are to be ground flush and polished, the edges should have the shearing burr on the soft steel side. However, when this is impractical, the sheet or plate edges should be lightly ground or filed to remove the burr at the stainless cross section. In drilling operations, the cutting should be continuous, avoiding friction which will work harden the stainless surface. The drills are ground so that both cutting edges will engage the metal. Use short drills to avoid chatter. Finally, layouts should be made on the stainless surface.

In bending, the best results will be obtained by using as large a radius at the bends as is consistent with good design. It is possible to produce 180 deg bends where the inside radius of the bend is one and a half times the metal thickness. The bend should be made slowly to give the metal an opportunity to flow freely and thereby avoid an excessive reduction or stretching of the metal in the bent area. Smooth, neat appearing bends result if these precautions are observed.

When severe bending or other forming operations are performed, the material should be in the annealed condition. The radii should be as large as possible, and compensation for springback should be made when bending. When low alloy steel backing is used for heavy gauge clad plate, the bending and rolling should be done hot. The straight chromium clad materials are not as ductile as other types of cladding, and hence allowance should be made for this factor, both in the design and fabrication.

Steel clad on both sides with 18-8 stainless has been drawn into a cup 6 in. in diameter and 7 in. deep, with a uniformly thick coating, in three draws and with no annealing. A similar cup made with solid stainless required four draws, annealing being necessary between the second and third drawing operations. The fully annealed clad behaves more like ordinary boiler plate than solid stainless. It can be bent, spun into deep heads, and drawn without damage.

All the cold fabricating operations, such as rolling, bending, braking, flanging, shearing and punching are done as with ordinary steel or solid stainless. As a general rule, for clad materials, cold fabrication is preferred to hot processing.

In the hot working operations, the clad steels should never be heated above the temperatures recommended by the manufacturer. The hot metal should be handled carefully to prevent damage to the clad surface. Clad plates may be worked the same as steel plates. The dies are dressed to remove any burrs which might gouge the clad surface. Hot working should be followed by suitable heat treatment to insure that the material is in the optimum condition for service. It is noted that the straight chromium clad materials are not as ductile as many of the other types, and hence a special allowance must be made for this factor.

In order to produce the desired corrosion resistance and physical properties, the clad steels are subjected to the controlled heat treatments using conventional equipment. Muffle type furnaces are desirable. If gas or oil is used as fuel, care is taken to prevent the material from being exposed to a direct flame.

Stainless clad steels require a neutral or an oxidizing atmosphere. The oxidizing atmosphere has the advantage of producing a scale which is more conveniently removed. In contrast to stainless clad, the nickel, Inconel and Monel clad steels should be heated in a reducing atmosphere; otherwise, surface or edge cracking may develop during hot working caused by prolonged heating in the upper portion of the hot working temperature range.

The type of heat treatment will vary according to the type of cladding and its thickness. Preheating may be desirable to prevent thermal shock when rigid sections, different thicknesses of clad steel, or heavy gauge materials with high percentage of cladding are being heat treated. In general, the differences in the coefficients of expansion of the backing metals and the cladding will give little trouble.

Finishing of Clad Steels

The condition of the clad surface is very similar to that of the equivalent type of stainless steel when used solid. However the polishing process is easier because the cladding is slightly softer and a higher speed is permissible, due to the presence of the mild steel backing which acts as a chill plate. The existence of the mild steel in the combination means that there will have to be modifications in the surface treatments.

The sodium hydride pickling process avoids attack on both metals, while at the same time it effectively removes the surface oxides. Sandblasting with clean silica sand followed by treatment of the stainless steel side with a nitric-hydrofluoric acid solution applied by swabbing, is a very effective system for insuring surfaces free from contamination. When dealing with light thicknesses, as for example a 3/16 in. plate with 10 per cent to 15 per cent cladding, special precautions should be taken to guard against cutting through to the steel backing, with chipping hammers, grinding wheels or other tools.

There are many applications which require that the weld surface should be ground flush, or that ripples be removed. The first grind is generally given with rubber or Bakelite-bonded aluminum oxide wheels of 16 to 36 grit, operating at speeds from 5,000 to 6,000 linear feet per minute (the recommendations of the wheel manu-

facturers should be followed). The wheel should be free cutting and its edge should be rounded. The grinding proceeds along the bead, care being taken not to tilt the wheel. A 3/16 in. plate with 10 per cent cladding has only 0.01875 in. of stainless steel, and a tilted wheel can soon cut through or seriously reduce this thickness.

The wheel should be used only for alloy work and its diameter should be small. The most efficient results are obtained when the wheel is allowed to ride the work and not held too long in any one place so as to avoid the danger of overheating the clad surface (heat tinting will appear at about 400 F). Where finer finishes are required than that produced by the 36 grit wheel, it is customary to use the finer 40-60 wheels. If it is necessary to match a No. 4 plate finish, the weld is not ground level with the plate, otherwise a depression may appear when buffing.

In the cleaning of welds and weld areas, the slag and oxides may be removed by sandblasting, stainless-wire brushing, or by acid pickling. The oxide is more quickly removed if the cleaning acid is applied prior to wire brushing.

The weld and its neighboring area are scoured with the acid solution using a stainless steel wire brush. The treatment is applied to several feet of weld at one time and then the acid is removed with clear water before proceeding to clean the next area. At the end of the cleaning process, it is advisable for the entire stainless surface to be swabbed with a cleaning solution, to remove iron particles which may have become embedded in the stainless surface during fabrication.

In the buffing and polishing of clad steels it is customary to use 18 to 20 sections of unbleached muslin wheels of 64/68 to 84/92 count. These wheels are sewed to produce stiffness near the center and flexibility near the edges. The abrasive used with the wheels is either aluminum oxide or silicon carbide. It is recommended that the grit sizes be reduced by 40 unit stages—for example, if 80 grit were first used, it is followed by 120 and then by 160; the grit is glued to the wheel. Cardboard or used wheels are inserted between the sections to increase the softness and to provide ventilation. As the grit size is changed, the direction of the wheel is altered 180 deg so as to help eliminate wheel marks in the plate surface.

In sandblasting techniques, the type of sand selected should be clean and completely free from iron. The blast should not be allowed to dwell for too long a period against any area, otherwise local erosion and surface irregularities will result. The scales formed on stainless steel are tenacious and may be quite impervious to normal pickling. Pickling or passivation treatments should follow sandblasting to make certain that all scale and embedded iron are removed. Before these treatments, it is necessary that all grease, oil and dirt be removed either by suitable solvents or by alkali cleaners—this will enable the acid solutions to spread easily over the clad surface.

Raw Edge Treatment

The different types of raw edge treatments selected will vary with circumstances. When stainless clad steel is used for protection against hard usage, it is generally sufficient to paint the edges. For sizes up to and including the 14 gauge sheet, the edges may be crushed. Closed tanks require no special consideration, since the joints are almost invariably butt welded. The edges of the heavier gauges may be covered with stainless by any convenient welding method. Quite often a stainless clad flange may be incorporated into the design. The problem of the exposed edge of strip is solved by beading the raw edge under the surface of the stainless.

Conclusion

The clad steels were developed to satisfy those conditions where a greater thickness is required than that supplied by the coatings obtained in the normal methods of hot-dipping, electroplating and metal spraying. Numerous alloys are being successfully used as cladding materials on plates, sheet and strip—coated either on one or on both sides. Composite materials with special properties are available and these include stainless steel and copper, or copper in combination with other corrosion resistant materials. The properties of clad steels are being studied by a number of engineers in various fields. They are now being widely applied and there is still much room for the extension of the less expensive types of stainless clad. Their future is very promising.

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California

Secretary E. W. Kimmell

The regular monthly meeting of the Institute of Gas Heating Industries, Inc., was held on April 14 at Nickabob's Restaurant in Los Angeles.

President Walter Dicus called the meeting to order, and following a brief introduction of guests, called for reports of the standing committees. In the absence of Chairman Pinatelli, Mickey O'Haver presented the report of the Heating Engineering Educational Committee. Both Mr. Haver's report and the report of the Business Administration Course committee, presented by Harry F. Haldeman, chairman, stated that the schools being held under their direction have been very well attended.

Mr. Ashburn, chairman of the Ordinance Committee, gave a complete report of his committee's work in drafting suggested changes and corrections in the Los Angeles heating code.

John F. Sullivan, guest speaker of the evening, titled his address "Not What Price Glory—but What Price Heating." Keynote of his talk was that there is little glory in doing a large volume of heating business if at the end of the year there is not enough money left to cover merchandising bills, labor, and necessary overhead. He explained that men in the industry should know their costs for themselves and not follow the price lead of their competitors. He also urged contractors to deal fairly both with themselves and with the public by performing the best possible installations in their heating work, so that their jobs would result in satisfied customers, which he termed the best advertisement any firm can have.

After a report from the advertising publishing committee, presented by Chairman Sam Jaffe, President Dicus called on the managing director of the institute who outlined some objectives of the year's work.

After a general discussion period, the meeting was adjourned. The next meeting will be held in the early part of September.

ERNEST W. KIMMELL
Recording Secretary

Canada

The Canadian Chapter, NWAH&ACA, held its fourth annual Eastern Ontario warm air heating school again this year at the Ottawa Technical School, Ottawa, Ontario, from April 18 to 21. Thirty delegates attended this school, representing 20 firms from 11 different centers. A. L. Acton was chairman in charge of local arrangements. G. E. Pallister, a member of the Technical Advisory Committee, and Stanley Bullis, assisted F. W. Taylor, chapter engineer, with the lectures. The featured address on "Controls—Warm Air Heating" was presented by Clifford Paisley.

According to a recent chapter bulletin, the Ottawa school was marked by an aggressive promotional campaign, with advertising and news coverage in the local press.

The Canadian Chapter wound up its 1949 dealer training program with schools at Moncton, N.B., May 2-6, and at Quebec City, May 9-13. The Moncton school, under the chairmanship of C. D. Hart, was attended by 41 delegates. A. G. Baxter, of the Technical Advisory Committee, and H. G. MacWilliam assisted F. W. Taylor with the lectures. Ivan McDonald spoke on "Controls."

Sessions at Quebec City school, which were conducted entirely in French, were attended by 27 delegates. Discussion this year covered not only the gravity manual but also the new French edition of the association's winter air conditioning manual.

J. Paul Thibault, president of the chapter, acted as local chairman. Lecturers were G. Dorval, L. Beaulieu, and A. Basque. The address on "Controls" was presented by Henry Marks of Montreal.

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Coming Events

June 17-18—The Carolina Roofing and Sheet Metal Contractors' Association, Annual Convention. Ocean Forest Hotel, Myrtle Beach, S. C. Salem Forsythe, secretary, Capitol Roofing Co., Raleigh, N. C.

June 20-22—American Society of Heating and Ventilating Engineers, Semi-Annual Meeting. Nicollet Hotel, Minneapolis, Minn. Chester T. Lawrence, chairman, Finance Committee, Minnesota Chapter, ASHVE, 1318 Marquette Ave., Minneapolis, Minn.

June 21-22—National Warm Air Heating and Air Conditioning Association, Mid-Year Convention. Edgewater Beach Hotel, Chicago, Ill. George Boeddener, secretary-treasurer, NWAH&ACA, 145 Public Square, Cleveland 14, Ohio.

SMCNA Debates Welfare Plans

Popular industry forums at convention approve Code of Standard Practice and Model Warm Air Heating Ordinance. Products Liability Insurance also analyzed for members.

APPROXIMATELY 300 contractors and their wives registered their attendance at the Sixth Annual Convention of the Sheet Metal Contractors' National Association, held in Wardman Park Hotel, Washington, D. C., May 9-11. The nation's Capital was selected for the 1949 meeting in conformance with a policy that recognizes an advantage in public relations of holding annual meetings outside the association's center of membership. The association's activities during the past year had brought many of its officers to Washington and resulted in governmental recognition of the industry's problems. "It is perhaps fitting," read the preface to the official convention program, "in these troubled times, when all true Americans are deeply concerned with the future of our democratic government and our free enterprise system, that our national association should hold its 1949 annual convention in our nation's Capital.

"Here, in Washington, stand the tremendous buildings we have erected to house the biggest government man has so far devised.

"Here are the visible evidences that we are not the first generation to face uncertainty and peril.

"Before these evidences of past fortitude and present greatness, small businessmen can orient their thinking and renew their faith in the United States as man's highest political concept."

Thomas Varden, Rev. Patrick S. Varden, and Mrs. Patrick Varden hear President Walsh's tribute to the former SMCNA president.

President Richard E. Walsh, St. Paul, Minn., called the convention to order and welcomed the delegates and their wives, who had been invited to attend the opening session. The president then introduced the Reverend Joseph Varden, son of the late past-president, Patrick S. Varden, who pronounced the invocation. The widow, Mrs. Patrick Varden, and another son, Thomas, were then escorted to speaker's rostrum where President Walsh presented to Mrs. Varden and family, a Patrick Varden memorial, commemorating the late past-president's stewardship of the association during the term 1945-47.

After the presentation ceremony, the ladies attending the opening preliminaries were excused and the Varden family was escorted from the meeting room.

President Walsh opened Monday afternoon's session by briefly reviewing his term of office, during which a full-time executive secretary was established in Elgin, Ill. His administration was marked by the influence of the Taft-Hartley law on the labor relations of the industry. When the new law became effective, it was determined that the sheet metal industry came under its provisions and compliance necessitated a revision of union agreements. Labor relations became an expanding activity. The speaker mentioned June, 1948, as the date the association first learned of the Sheet Metal Workers' International Association's interest in a welfare program for its journeymen members. The president reported that a committee had been appointed to explore this new principle in labor negotiations and that the subject would be fully discussed during the convention.

Treasurer C. M. Gundlach, Sandusky, Ohio, reported in detail on the financial condition of the association. His summary indicated that the expanding activities have strengthened both its membership roll and its finances.

The Secretary's Report

When President Walsh introduced Executive Secretary Joseph D. Wilder, Elgin, Ill., he expressed the association's appreciation for the time and effort the secretary spent on association business during the past year. During his report to the membership, Mr. Wilder noted that the former National Sheet Metal Contractors Association held its 20th annual convention in Washington 25 years ago. Among the members in the audience who had attended that convention were Ben Kolbenschlag, St. Louis, Mo.; J. E. Merrick, Louisville, Ky.; and W. J. Keist, Pittsburgh, Penn.

Mr. Wilder reviewed the activities of his office during the past year, which consisted in part of keeping the membership fully informed through bulletins about the progress of the programs of the association's committees. While the membership of each committee is distributed nationally, he said a task force located so it can meet conveniently avoids considerable expense and overcomes the difficulties in getting a large committee together.

The secretary did not claim responsibility for relieving the serious sheet steel shortage last year, but he claimed that placing the plight of contractors before the steel industry, senators, and representatives in Congress, and other governmental officials was effective.

His experiences during the past year have proved that no businessman gets anywhere by himself. He said businessmen must request and demand as a pressure group. For this reason, the association membership should be large and representative of the industry. He appealed for a larger membership of contractors and suggested affiliation of all local and state associations with the national organization. A national association representing 5,000 contractors would receive more serious consideration, he said.

Mr. Wilder then said that bulletins are mailed to local associations so that information can be passed on to the local membership, but that in some instances local secretaries have not apprised their members of the national activities. He urged all members present to assist in releasing the information to the industry.

Mr. Wilder closed his report by thanking the officers, directors, committee chairmen, and committees for their cooperation and efforts in advancing the association programs.

Code of Trade Practice

E. B. Brown, Jr., Chicago, Ill., chairman of the Trade Relations Committee, reported on the status of a Code of Trade Practices for Sheet Metal Contractors and Architects and Consulting Engineers which was scheduled for discussion during the forums on Tuesday. Commenting on the improvement in the supply of sheet steel, Mr. Brown stated that the gray market was quoting prices less than current warehouse prices.

W. J. Keist, Pittsburgh, Penn., chairman of the Warm Air Heating Committee, C. M. Gundlach, co-chairman of the Bookkeeping Committee, W. J. Perkinson, Chicago, Ill., chairman of the Architectural Sheet Metal Committee, N. J. Fisher, Louisville, Ky., chairman of the Fume Removal-Dust Collecting Committee, and Frank Kramer, Milwaukee, Wis., chairman of the Apprentice Training Committee, each briefly reported their activities which were to be discussed fully in the scheduled forums.

Apprentice Awards

President Walsh next introduced Philip W. Olmen, Chicago, Ill., vice president of the association, who presented an award to J. A. Nyland, Indianapolis, Ind., chairman of the Indianapolis Sheet Metal Joint Apprenticeship Committee, for his committee's outstanding work in advancing apprentice training. Mr. Olmen explained that the idea of an award for three outstanding apprentices and one outstanding apprentice training committee was conceived by Roy M. Moffitt, of the Ventilating and Air Conditioning Contractors' Association of Chicago (AMERICAN ARTISAN, June, 1948). The competition was nation-wide and 250 apprentices were entered. A sheet metal development problem consisting of an offset rectangular fitting was prepared by Joseph J. Kaberlein, business agent, Local 73, Sheet Metal Workers' International Association.

Robert J. Byron, president, SMWIA

Luncheon speaker, George F. Meredith

Three awards for satisfactory completion of the problem were announced, being won by Raymond J. Aslin, Milwaukee, Wis.; George B. Mattison, Minneapolis, Minn.; and Samuel B. Smith, Somers Point, N. J. Awards to apprentices were based on appearance of the completed work, length of time required to make

J. A. Nyland, Indianapolis, receives apprentice committee award from Philip W. Olmen.

the fitting, and an explanation of the development of the pattern.

The award to the outstanding committee was based on brief resumés entered by apprentice training committees outlining their activities in promoting apprentice training programs.

Louis L. Narowetz, Chicago, Ill., concluded Monday afternoon's scheduled session by reporting on the progress of the Joint Board for Settlement of Jurisdictional Disputes. The speaker explained how the board, provided for in the Taft-Hartley law, functions and that its expenses are met by industry and labor. He expressed the opinion that the board's procedure has solved the jurisdictional problems satisfactorily, voiced the association's approval of this provision, and anticipated its continuance in new labor legislation, if enacted.

Union President Speaks

Robert J. Byron, president of the Sheet Metal Workers' International Association, who was present during the presentation of awards, then addressed the convention. He called attention to the cooperative efforts necessary in building up the sheet metal industry. Some contractors, Mr. Byron said, are lax in seeing that all sheet metal work is included in sheet metal specifications. Other industries have attempted to take away sheet metal work and he described it as discouraging to find contractors who are content to permit these encroachments.

He stated that welfare plans have become an important part in labor programs and appealed for cooperative efforts in solving problems they present.

Mr. Byron confirmed Mr. Narowetz' comments on the satisfactory disposition of jurisdictional disputes by the joint board and expressed SMWIA's approval of this procedure.

After preliminary announcements and a report of the Nominating Committee, announcing its proposed slate of new officers, Tuesday morning was devoted to labor

1949 Officers

Philip W. Olmen, Chicago	President
W. A. Wiedenmann, Kansas City	1st Vice President
Frank Kramer, Milwaukee	2nd Vice President
E. B. Brown, Jr., Chicago	3rd Vice President
C. M. Gundlach, Sandusky	Treasurer
L. L. Stefanik, Milwaukee	Sergeant at Arms
J. D. Wilder, Elgin	Executive Secretary

Directors

Term ending 1952—

Ernest Blattman	New Orleans
Angelo Hoffman	Milwaukee
Lester Peterson	Duluth
A. F. Richter	St. Louis

Term ending 1951—

William P. Flanigan	Baltimore

relations. Roy Dose, St. Paul, Minn., chairman of the Labor Relations Committee, acted as moderator of the session.

Tuesday's luncheon was highlighted by an address by George F. Meredith, former executive director of the Senate Small Business Committee, which was enthusiastically applauded by the delegates. His subject, the Small Business Man's Problems, found a receptive audience. A review of Mr. Meredith's presentation, including excerpts, will be found this month in Arnold Kruckman's WASHINGTON LETTER.

H. W. Wenning, New York City, labor relations consultant, thoroughly explained welfare plans—labor's new proposal in wage negotiations. He mentioned that he was not there to sell a plan or to tell contractors how to run their business. However, the principle of welfare has taken a tremendous hold throughout the country and, in his personal opinion, these plans are becoming prevalent in American industry and are here to stay. He had been asked by the association to explain the different types of welfare plans and to recommend a plan most suitable to the industry.

Reading from a specially prepared report, he said he would not offer advice with respect to what the members of the association should do on the question of welfare plans, whether they should or should not sponsor such plans. He suggested three alternatives which the association might follow:

1. Flatly oppose the inclusion of welfare plans in bargaining agreements.

2. Sponsor and support such plans and take an active role in developing the principles and procedures on which they are to be established.

3. Adopt no one policy, leaving each of its members free to pursue his own course on this question, but making available technical advice and assistance to those who want it.

Mr. Wenning offered four general ways in which group insurance benefits may be provided to the employees of a particular establishment or industry:

1. Through insurance policies held by individual employees.

2. Through insurance policies issued to a trade union.

3. Under certain specified conditions and in certain areas, through policies issued to a trade association.

4. Through policies issued or assigned to the trustees of a fund established by employers, by trade unions, or by both.

After citing several negative aspects of the first three plans, the speaker outlined important advantages for the sheet metal industry in group insurance benefits issued or assigned to trustees. He said such a plan could be either national or regional, covering all employees of all employers in an area, removing the problems arising from fluctuation in employment, characteristic in the construction industry.

Included in welfare plans are benefits for death, accidental death or dismemberment, loss of pay through disability caused by accident or sickness, and hospitalization, including surgical and medical benefits. The most important single factor in the cost of these benefits is the size of the group, and for this reason, Mr. Wenning suggested a national plan to cover everyone who wants to be covered, or, if a national plan is not practical, a regional plan in which the area is as large as possible.

Association Attorney Talks

R. S. Felhaber, St. Paul, Minn., legal consultant of the association, discussed some of the legal aspects of labor relations and confirmed the association's approval of the present machinery for settling jurisdictional disputes. He deplored the inability of the 81st Congress to come to a decision on labor legislation and hoped that its level headed members would act to retain the desirable features of the Taft-Hartley law. He also called attention to the new labor agreement which provides an answer to the overtime on overtime problem.

Mr. Felhaber contributed further to the discussion on welfare plans by stating they are not new but only new from the standpoint of union promotion. Many large corporations established welfare plans after World War I, to show their employees they did not have to join a union to secure these benefits.

Health and accident benefits of $2 and $3 per day, he cautioned, are worthless and suggested benefits which amount to two-thirds of an employee's pay. He recommended dealing with competent insurance agents when arranging welfare plans because real savings can be realized from expert advice.

All employees should be included in a welfare plan. Mr. Felhaber pointed out that if plans are developed for only union employees, others—often key employees —are being discriminated against.

The speaker observed that the wages of construction workers have averaged about 40 per cent more than factory workers, and then posed the question: Will welfare plans cause wages to approach factory wages?

When Mr. Felhaber concluded his talk, the meeting was opened for discussion on labor relations problems. Moderator Dose said that it has been suggested that small employers pay a wage differential of 10 cents per hour additional to the union to take care of welfare for their employees, the money collected to be set aside as a trust fund. Mr. Dose questioned the advisability of any plan that creates idle trust funds across the country and suggested that demands for new benefits would arise as the funds build up.

It was intended that the convention would decide the policy of the association toward welfare plans. However, no agreement could be reached. A motion was adopted directing the incoming administration to investigate the subject further and to recommend several plans which will be reported to the membership in the future.

The warm air heating forum, presided over by W. J. Keist, was well attended but limited by the time allotted to discuss the prime subjects on the agenda.

Products Liability Insurance

William B. Stevens, Aurora, Ill., chairman of a subcommittee appointed to investigate products liability insurance, read a prepared committee report which provides guidance in obtaining protection against liability from damage after a heating installation has been completed.

Several examples of this type of liability were outlined. One cited the case of a contractor who had cleaned a furnace, completed the work, and collected his money. That night, hours after the workmen had left, the house caught on fire. The contractor was sued for $2,000 and a jury held him at fault and liable for the damages.

Mr. Stevens said there are so many conditions of liability the committee recommends that contractors obtain adequate insurance protection. He warned that public liability insurance does not cover the type of liability cited, as it ceases as soon as the workmen have completed their work and leave the customer's premises.

Most companies sell combination comprehensive liability policies which, according to the committee report, protect against all types of hazards. Such policies cover every accident occuring during the life of the policy, irrespective of the date of the installation.

The committee believes that every heating and sheet metal contractor should provide himself with comprehensive liability insurance and that the cost should be considered as an item of business overhead.

Dee Cramer, Flint, Mich., chairman of a subcommittee appointed to investigate warm air heating

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R. F. Robinson, G. P. Myers, E. W. Nelson, A. L. Sykes and W. J. Perkinson; all members of the Sheet Metal Contractors' Association of Cook County, Illinois.

The Florida group assembled

Florida Discusses Management Problems

THE annual convention of the Roofing & Sheet Metal Contractors Association of Florida, in the Robert Richter Hotel, Miami Beach, Fla., April 22-23, proved that it was well-organized by starting promptly, adhering strictly to the convention time schedule, and recessing and adjourning on time.

President J. M. Montgomery, of Coral Gables, called the convention to order. Following brief welcoming speeches, the reading of the minutes of the previous convention, and the secretary-treasurer's report, by Secretary-Treasurer John Caldwell, of Orlando was approved.

The report showed the association to be in sound financial condition, with increasing membership and expanding association services.

President Montgomery appointed a nominating committee, with Wm. N. Palmer of Miami as chairman. The committee retired and quickly brought in a recommendation for nomination of officers. There being no additional nominations from the floor, the nominations were approved unanimously.

Clearwater, Florida, was selected as the next convention city.

The entertainment program culminated in a banquet, floor show and dance for delegates, members, their ladies and guests, on Saturday evening, in the Robert Richter Hotel, with over two hundred and sixty present.

Constructive addresses by Henry E. Voegeli, development engineer, The American Brass Co.; T. M. Dantz, the Ruberoid Co.; B. J. Lyons, Johns-Manville Sales Corp.; Carl Timpe, the Barrett Division, and a movie presented by Ivar E. Anderson, Research and Development Department, Revere Copper and Brass, Inc. highlighted the convention program.

All speakers from the industry were in accord that business was returning to the era of increased supplies, increased competition and increased costs that could be countered successfully with increased efficiency, increased selling effort, improved methods and decreased expenses.

The use of quality products, manufacturers' sales helps, thorough analysis of local conditions and potential markets, the development of skilled mechanics, increased shop efficiency by the use of labor saving equipment and systematized work routines and last, but equally important, a thorough self analysis and improvement of personal selling effort and customer and public relations, were advised.

Subjects of statewide interest in the industry were covered by local speakers including "The Advantages and Disadvantages of Self-Insurance," by H. L. Gregory, a representative of a private insurance company; "The Social Security Administration's Old-Age and Survivors Insurance" program, by Wm. B. Weaver, manager of the Social Security Administration Office in Miami; a movie showing the procedure necessary for an unemployed beneficiary of the Florida Unemployment Compensation Act, to obtain his weekly benefit payments, and the efforts of the Florida Unemployment Division and the Florida Employment Service, to reestablish the unemployed beneficiaries in gainful employment.

Professor Brooks Johnson, of the University of Miami, spoke upon economic conditions and present trends, declaring the growth of big business, and the concentration of wealth and power in the hands of a few large corporations tended toward monopoly and the elimination of the small manufacturer and independent business man, by stifling competition, creating a scarcity of materials and upholding prices.

Professor Johnson, citing additional statistics, stated that in the industry, four roofing manufacturers controlled forty-three per cent of the business, while in sheet metal, four manufacturers controlled forty-nine per cent of the business.

Business Too Big?

Big business, said Professor Johnson, in the form of certain corporations, had become so powerful that local and state governments could no longer control them through local and/or state laws. Therefore, the citizen looked to the Federal Government for laws to break up and to control monopolistic corporations.

Professor Johnson's theory was that large corporations should be decentralized or broken up, although admitting, upon question, that this procedure might cause duplication of purchasing, financing and manufacturing processes and management problems that would increase the cost of the finished product to the consumer. In the automotive industry, for example a solution to this problem would be to use the dividends paid to investors, or the reserves to reduce the price of the car. One harassed taxpayer in the audience was overheard to remark that if the big automotive corporations were reduced to little ones, the price of the car reduced, by reducing the dividends paid to investors, the investors might also be reduced, which would reduce the number of cars produced, and everyone knows that decreased production increases costs.

While not favoring the growth of large powerful labor organizations, Professor Johnson cited their growth as necessary for the worker to obtain proper consideration and concessions from the large corporations. He advised the convention members to protect their interests through their trade associations rather than joining the big organizations such as the U. S. Chamber of Commerce, or the National Association of Manufacturers, two big organizations whose interests were in making the big corporations bigger.

The address of H. L. Gregory, on advantages and disadvantages of self-insurance under the Florida Workman's Compensation Act, was an unbiased summation. Mr. Gregory stated that according to Florida Industrial Commission estimates, there are approximately 35,000 employers in Florida subject to the provisions of this Act. Only 110 of this number have elected to become self-insurors, including only one roofing and sheet metal contractor.

The Florida Workman's Compensation Act is for the payment of claims for injury or other disability received by employees, if covered under the Act, and is not to be confused with the Florida Unemployment Compensation Act, which provides for the payment of weekly checks to workers, during unemployment, under certain conditions, if they are covered by the provisions of the Act.

In Florida, the employer of three or more persons, in most classifications, is required to carry workmen's compensation insurance, either with the Florida Industrial Commission Workmen's Compensation Division, or, upon approval by the Commission, he may insure with a private insurance company licensed to do business in Florida.

Mr. Gregory's remarks would indicate, that because of the numerous regulations, special forms and reports, taxes and posting of private bonds, penalties and other details of insuring with a private company, except for certain employers, under certain conditions, the self-insuror was at a disadvantage.

William B. Weaver, manager of the Social Security Administration office in Miami, explaining that he could not predict what changes might be made in the present Social Security Act, now under consideration in Congress, made it clear that employers, who were now subject to the provisions of the Act, should comply with all of its provisions, not only because it is the law, but because it is good business and good employee relations.

Left: W. N. Palmer, immediate past president

Right: George Warren, 1949 president of the association

Mr. Weaver advised employers to require their personnel charged with the responsibility of hiring and paying employees, to insist that new employees produce their social security card, instead of trying to recite their social security number from memory, and to copy the information required, directly from the social security card, making sure of course that the card itself has been brought up to date with any changes noted.

Rumored changes by the present state legislature in the two laws, the Workman's Compensation Act and the Florida Unemployment Compensation Act, were discussed and it was the consensus that those present should oppose the rumored changes as individuals and as an association. The secretary-treasurer was instructed to obtain full information and advise the members through circularization, of the changes contemplated.

It was believed that these changes would impose a greater hardship upon employers at a time when it is recognized that competition is becoming more acute and the costs of business are increasing, while business volume is decreasing.

Among the rumored changes in the Workman's Compensation Act are:

Increase of total period of payment for total disability from present maximum of 350 weeks to life.

Increase of weekly benefit payments to insured from present $22.50 to $30.00.

Reduction of present compulsory coverage of employer of three or more employees, to employer of one or more employees.

Rumored changes in the Florida Unemployment Compensation Act are:

Broadening the compulsory coverage of employers of eight or more employees at present, to include employers of one or more employees.

Maximum benefit payments to unemployed, qualified under this Act, are now $15.00 per week. It is proposed to increase this amount to $20.00.

Period for which unemployment weekly benefits could be collected would be increased from the present 16 weeks to 20 weeks.

A new provision proposed that employees covered by the Act rendered idle because of a strike, or labor troubles, presumably not of their own making, might become eligible for unemployment compensation after a "cooling off" period of from three to seven weeks.

The Act would be amended to bring under jurisdiction, employers and employees in fields not now affected.

Under the present Florida law, the employer pays a tax upon his payroll of 2.7 per cent. Approximately 360,000 employees in Florida are now under the Act's jurisdiction.

Henry E. Voegeli, development engineer, the American Brass company, in his address upon sheet copper briefly traced the growing use of sheet copper in the roofing and sheet metal fields. Pointing out that some copper roofs are still in existence after two hundred years, he told of the use of copper for flashings, hanging and built-in gutters, in places where other roofing materials were impractical or inadequate. Mr. Voegeli then described additional applications for sheet copper and outlined some of the continuous experiments and research by his company to establish new uses for copper and to perfect the quality, and increase the efficiency, of its present uses.

Assuming from various authorities' estimates that the life of a building is from 50 to 75 years, Mr. Voegeli asserted that any material which is reasonable in price and which will last the lifetime of the building, is economical to use, and that in these qualifications, copper leads all other materials.

Mr. Voegeli reported that a growing tendency in architectural and engineering design for radical changes, is rapidly increasing the use of copper for overhanging cornices, columns, pilasters and related decorative ornament and shadow lines. He remarked upon the many and distinctive types of Miami Beach hotels in the new international style of design. The horizontal shadow bands, commonly made of reinforced concrete or stone, he thought could be made of metal for economy in first cost, low maintenance and durability.

Solar Water Heaters

Commenting upon the wide use of solar water heating units with copper coils in Florida, in which the state leads the nation, being practically and especially adapted to the climate with its equal distribution of sunshine through the year, Mr. Voegeli predicted that with experimental projects now under way, the industry would see the development of an improved solar water heating unit with greater efficiency and capacity for other purposes than heating water for household use. The use of copper is increasing in year-round air conditioning, as well as for the all copper roof that is to be flooded for evaporative cooling or to serve as a spray pond or for a cooling tower.

Ivar E. Anderson, Research and Development Department, Revere Copper and Brass, Inc., furnished the convention with a film produced by his company showing the proper application of materials and workmanship in working copper sheets.

1949 Officers

George Warren, Clearwater	President
J. M. Montgomery, Coral Gables	1st Vice President
A. C. Ferguson, Jacksonville	2nd Vice President
Otto Krauss, Jr., St. Petersburg	3rd Vice President
J. J. Caldwell, Orlando	Secretary-Treasurer

Directors

Wm. N. Palmer	Miami
Ellard G. Kohn	Miami
Howard Carpenter	West Palm Beach
John A. Gross	West Palm Beach
George Ferber	Jacksonville
Mack Fillingham	Jacksonville
Frank Tack	Clearwater
J. E. Boyette	St. Petersburg
Grant Falkner	Orlando
C. R. Bergquest	Lakeland
R. C. Tucker	Ocala
John Jertz, Jr.	Tampa
A. T. Nettles	Tallahassee

NATIONAL ASSOCIATION OF SHEET METAL DISTRIBUTORS

39th Annual Spring Meeting

THE 39th annual spring meeting of the National Association of Sheet Metal Distributors, held at the Deshler-Wallick Hotel in Columbus, Ohio, was formally opened at 10 o'clock on May 9th by President John Speck. After welcoming members and guests on behalf of the association, President Speck introduced Thomas A. Fernley, Jr., executive secretary, who reported to the meeting on the activities undertaken by the association since the fall meeting.

W. P. Tracy, president of the Tracy Wells Co., Columbus, Ohio, then discussed the need for a thorough analysis of our business tax structure and explained how revisions would help business.

"Wholesale Distribution" was the topic of the next address, delivered by James H. Davis, assistant professor of business organization at Ohio State University. Mentioning that there is " a common misconception that distribution in general and wholesaling in particular are inefficient," the speaker went on to prove that the wholesaler occupies a very important place in our economy because of the services he performs for his customers and for his suppliers.

Summing up the services which the wholesaler performs for the manufacturer, they may be said to be "complete coverage at small cost, more efficient storage than the manufacturer could manage, and lessening of the manufacturer's need for capital."

The next speaker of the morning session was Robert M. Nelson, Armco Steel Corporation, who reviewed the figures on steel production in 1948 and then took up the subject of demand in the present market. Mr. Nelson stressed the fact that the buyer's market rather than being a situation to fear is merely the normal condition which gives rise to a true spirit of competitive enterprise in industry.

The remainder of Mr. Nelson's talk was devoted to a review of the development of zinc coated sheet steel and a discussion of the highly efficient properties of this new material. He concluded his address with the promise that sheet metal distributors "will have both superior products and an adequate supply to combat inroads of plastics and other substitute materials" in the competitive market.

Members again turned their attention to the overall outlook for business when H. H. Maynard, professor of marketing at Ohio State University, began his address on "Business Conditions." While predicting that business as a whole would remain good, the speaker pointed out that in his opinion labor costs and taxes would remain so high that greater operating efficiencies would be demanded to maintain the profit level.

After adjournment for lunch, sessions were resumed at 2 p.m., with Edward V. Hickey of the National Security Resources Board as the first speaker. After explaining the general purpose of the NSRB, Mr. Hickey acquainted the wholesalers with the steps being taken to prepare industry for the mobilization which will be necessary in case of war emergency. To perfect these plans, he said, government must have the cooperation of all industry in planning for production, expansion, and relocation of plants which would be needed to meet wartime needs.

"Credit in 1949" was the title of the talk delivered by W. B. White, credit manager of the Smith Brothers Hardware Co., Columbus, Ohio. Stressing the importance of credit in business, Mr. White discussed the problem of safeguarding credit in times like the present. Quoting Department of Commerce figures, the speaker revealed that more than 25,000 new wholesalers entered business in 1946, and about 13,000 more in 1947. During 1948, 4,500 more entered the field, making a total of 42,500 in three years. As a result, the number of wholesalers had increased, at the end of the last year, to 186,000 while retailers numbered 1,778,000, or only 9.5 retailers for every wholesaler.

The return of competition and the resultant shrinkage in retail outlets may drastically reduce the number of wholesalers. Many retail businesses which were started in the war period when money was plentiful have since failed because of lack of experience in business management, especially in handling of credit risks. As competition increases, it is foreseeable that these businesses which were started at a time when study of credit risks was not necessary, will be on an unsound financial basis, and many more will fail. For that reason, the wholesaler should make a careful analysis of all credit risks with particular attention to increases in inventory and increases in accounts receivable as against sales. Losses in bankruptcy as well as business failure can be avoided, not by the expenditure of money "but simply by the exercise of common sense and good business judgment," according to Mr. White.

John Phillips of Stelwagon Manufacturing Company, Philadelphia, stressed in his address that only one operation is of major importance to the distributor himself in relation to his manufacturer source. A distributor exists to sell the manufacturer's line. It is his responsibility to see that all phases of his business are properly organized and controlled so that they assist in the sales of the manufacturer's product. He warned that if any of the operations entailed in the wholesaler's business are not efficiently organized they may become actual obstacles to sales. He cited the

case of a wholesaler who allowed his inventory to get so out of balance on one expensive or extremely bulky product, that limited capital or lack of warehouse space would prevent him from carrying a sufficient stock of some other commodity, such as warm air furnaces. This would result in a drastic reduction of his effectiveness as an outlet for the furnace manufacturer.

Another example would be the case of a wholesaler who extends excessive credit and immobilizes too much of his working capital in accounts receivable; therefore he is not able to maintain enough stock to adequately serve his territory for the manufacturers.

To avoid such obstacles, Mr. Phillips advised the wholesaler to organize a written policy framework under three headings. First, a delivery policy should be reduced to writing so that all members of the organization would know the absolute limit at which they could profitably assume delivery costs. Second, an inventory policy, in writing, should be established to prevent overstocks. Third on the list, is a written credit policy which can be constantly used as a yardstick to measure a customer's credit limits.

With an orderly and efficient policy framework, the wholesaler finds himself in a better position to fulfill his primary purpose, that is, selling the manufacturer's product.

Following a general discussion period, the meeting was adjourned, and at 6:30, members and guests enjoyed an informal dinner held in the Hall of Mirrors.

President Speck opened the Tuesday morning session and introduced Thomas W. Stevens of the Tiffin Art Metal Co., Tiffin, Ohio, as the first speaker. Speaking on "The Function of the Jobber or Distributor," Mr. Stevens said the wholesaler must create incentive buying, being careful to avoid methods which accumulate sales volume at the expense of the wholesaler's profit rather than create additional sales volume. The major functions of the distributor, as he outlined them, are to carry stock necessary to meet peak demand, to provide diversified stock, to assist the dealer in market analysis, and to provide financial assistance to the dealer by freeing him from costs of warehousing stock. Summing up the situation, he said that by clarifying his function to the trade, the wholesaler may be expected to continue indefinitely in his important place in the business structure.

Reporting on his studies at the dealer level in his community, Herman L. Lodde, The Conner Manufacturing Co., Louisville, said that the dealer rightfully expects the same protection in his buying as does the wholesaler, and that the wholesaler can withdraw this protection only at his own peril.

In the open forum which followed, A. M. Vorys, president of Vorys Bros., Columbus, requested that sheet metal distributors develop real sales plans to better serve the dealer and thereby get some of the volume of business which at present is being sold by the manufacturer direct to the dealer.

After a short period devoted to new business, the meeting was adjourned. The association plans to hold its fall meeting in Atlantic City, N. J., and notices to all members will be sent out by Secretary Fernley in the near future.

Association Activities . . .

(From page 115)

The board of directors of the chapter recently approved three applications for manufacturer membership, bringing the total of manufacturer members up to 33. The new member companies are Canadian John Wood Manufacturing Company, Limited, Toronto, Ont.; Conroy Manufacturing Company, Limited, St. Catharine, Ont.; and Pendell Boiler Limited, Toronto, Ont.

In its April News Letter the chapter announced that two worthwhile aids for promoting warm air heating are now available to its associate members. These are the decals and electrotypes of the *Indoor Comfort* emblem which are already being put to profitable use by some members. The chapter urges dealers to use the emblem on stationery and in advertising of all kinds to inform the consuming public that these dealers are participating in a movement to provide the best there is in warm air heating.

Chicago

At the regular monthly meeting of the Midwest Stoker Association, held in Chicago on May 6, E. M. May, Chicago manager for Steel Products Engineering Company, was elected a member of the Board of Directors. Mr. May succeeds H. C. Requa of the Central Fuel Corporation, Chicago, who resigned as one of the association's five directors because his time was completely taken up with attention to his company's coal activities.

In addition to being a director of the association, Mr. May is also chairman of the organization's Engineering Committee and is a past president.

The association has announced that its annual summer golf tournament will be held at the Mt. Prospect Country Club on July 22, 1949. Joseph G. Beard, chairman of the 1949 Entertainment Committee, is in charge of the event. Announcements of final arrangements will be made around the middle of June.

Indiana

The Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc., reports, via its May News Bulletin, that the first quarterly board meeting of 1949 was held on April 9 in the Hotel Severin, Indianapolis, with all officers and board members in attendance.

One of the highlights of the meeting was President Garber's report on his trips to the Ohio and Illinois conventions.

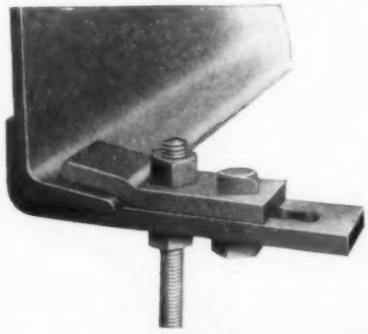
District meetings for 1949 are planned for July 15 in Terre Haute and for October 7 in South Bend. As usual, these meetings are expected to contribute much of value to the contractors and salesmen.

In addition, several committees were appointed to make plans for the 32nd annual convention of the association which will be held on February 2 and 3, 1950, in the Hotel Severin, Indianapolis.

EQUIPMENT DEVELOPMENTS

Adjustable Clamp 100

A channel clamp is being offered as a solution to the problem involved in supporting runs of pipe from structural channel or angles, where drilling of such building members is either forbidden or too



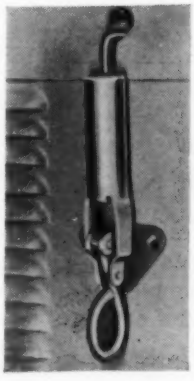
costly. It rigidly grips various sizes of steel channels or angles and has a load rating of 500 lbs, with a safety factor of 5.

This adjustable clamp, No. 177, complements the line of pipe hangers and supports made by this manufacturer.

The Kindorf Co., 681 Market St., San Francisco 5, Calif.

Spring Fastener 101

A heavy duty spring-loaded hood fastener, which was originally designed for engine hoods, has a wide application in the field for air conditioning ducts, removable panels on heavy duty machinery and housing. Weighing approximately 10 oz and measuring 7 in. in length, the spring fastener has a take-up of 7/16 in. and retains, in the closed position, approximately 40 to 50 lbs tension.



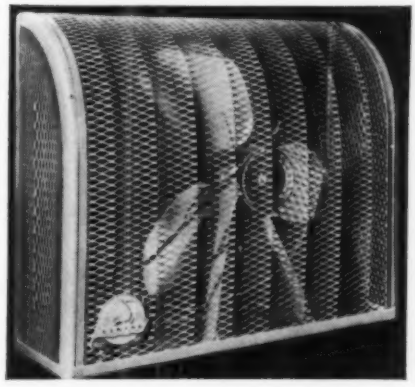
The fastener is suggested for use on air conditioning installations, heating equipment, and in all metal trades where a spring fastener is required for heavy duty.

Donaldson Co., 666 Pelham Rd., St. Paul, Minn.

Use Coupon on Page 125

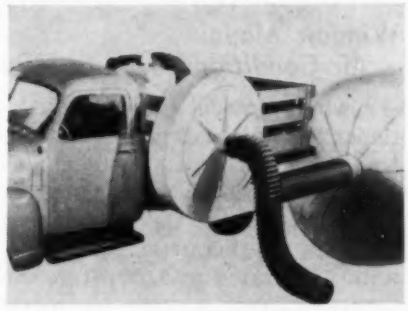
Window Fan 102

New low cost, high volume window fan, for cooling small homes and medium size apartments, is rated at 3,100 cfm (NAFM rating). This 22 in. fan is powered by a ⅓ hp, 110 v, 60 cycle motor and uses a v-belt drive which assures quiet operation. Overall dimensions are 28 x 24 x 10 in. The fan will fit any window with inside dimensions between 24 and 45 in. Adjustable spacers available for wider windows.



A built-in automatic electric timer which turns the fan off at any desired hour is available.

Viking Air Conditioning Corp., 5600 Walworth, Cleveland 2, Ohio.



Power Furnace Cleaner . . . 103

New power-suction cleaner, known as the Kleenmaster, is offered as a completely packaged unit for cleaning flues, ducts, chimneys, and combustion chambers in any central heating system. Package includes a 1949 Ford or Chevrolet truck, power unit assembly which consists of engine with electric starter and hand throttle, a heavy duty steel exhauster, sateen filter bag, and flexible reinforced tubing. Sales aids are also included. Power assembly units are available for mounting on either side of truck to conform with state traffic laws.

The Kleenmaster is also available in a trailer mounted model or without truck or trailer. Units are guaranteed for one year.

Molloy Sales Corp., 3445 North Western Ave., Chicago 18, Ill.

MAIL THIS NOW

We will ask the manufacturers to send full particulars about the products and literature mentioned. 6-49
Be sure to circle the items you want.

Equipment Developments

100	101	102	103	104	105	106	107
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New Literature

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265	266						

Manufacturer ☐ Jobber ☐ Dealer ☐

Name . . . . . .

Company . . . . . .

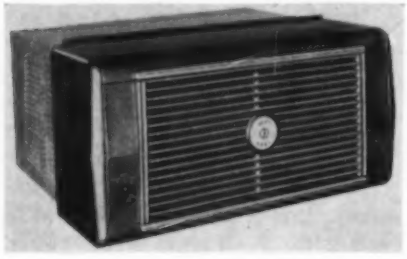
Address: AMERICAN ARTISAN, 6 North Michigan Ave., Chicago 2, Illinois

EQUIPMENT DEVELOPMENTS

Use Coupon on Page 125

Window Model Air Conditioner 104

A window model room air conditioner is being marketed under the trade name of Quiet Kool, emphasis being placed on its quiet operation. This model, G-5, is powered by a ½ hp hermetic compressor unit. It is rated at 5,850 Btuh and is provided with a single fan motor operating at 1,075 rpm. The steel



cabinet, which projects only 9¾ in. into the room, has a hinged cover to facilitate changing the filter. Air direction may be altered to suit room requirements.

Quiet-Heet Mfg. Corp., 135 N. J. Railroad Ave., Newark 5, N. J.

Chemical Dehumidifier . . . 105

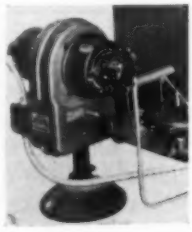
An electrically powered dehumidifier, known as Arid-Aire, is designed to eliminate excessive moisture from basements, recretion rooms, and storage areas. It employs calcium chloride as the basic dehumidifying agent. Moisture laden air is drawn into the unit, filtered, and forced out at the top by a motor driven centrifugal blower. A drip container is supplied to catch the moisture.

One unit can control the excess moisture in an enclosure of about 4,000 cu ft volume. Arid-Aire comes equipped to plug in any outlet on a 120 v house lighting circuit.

Air Appliances Co., P.O. Box 5487, Indianapolis, Ind.

Gas-Oil Burner 106

The "Combi-Matic" burner has been designed as a gas burning attachment for an existing gun type oil burner installation. It is constructed of stainless steel and is so designed that it will fit in the front of a standard combustion chamber, making for easy installation. The gas burner is installed underneath the air tube of the oil burner and has an automatically controlled damper that closes when the oil is on and opens when the gas is on, thereby giving maximum efficiency when burning either fuel.



The Combi-Matic can also be installed as a straight gas burner. If a failure in gas supply or a gas shortage develops, an oil burner can be added to make it into a twin fuel unit.

Siemon & Co., 3034 Main St., Kansas City 8, Mo.

Air Conditioning Furnaces . 107

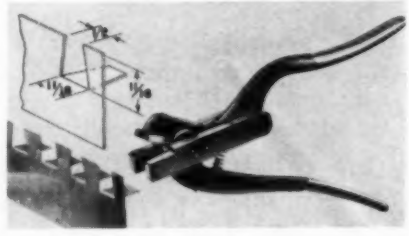
A manufacturer of water heaters and floor furnaces is now offering a series of winter air conditioning furnaces. These furnaces are designed for either oil or gas firing; bonnet outputs range from 60,000 to 100,000 Btu's.

The oil fired unit incorporates a flange mounted pressure atomizing gun type burner, completely enclosed. The gas fired unit is equipped with a single port, fountain type gas burner especially designed for this furnace. Large centrifugal type blowers with adjustable motor pulleys are standard equipment. The units measure 26 in. wide x 54 in. long x 52 in. high.

J. L. Gillen Co., Dowagiac, Mich.

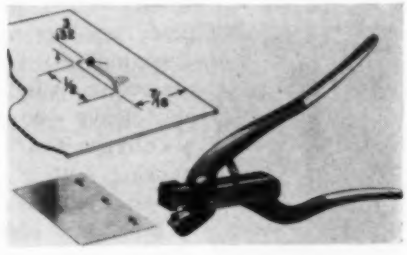
Notcher and Punch 108

Two new hand tools, a dove tail notcher and a snap-lock punch, have been designed to speed sheet metal work. With the notcher, the operator is able to notch clean dove tails in mild steel up to 20 ga and fold tabs down square in one motion. This eliminates the necessity of using snips, making double cuts, and using an additional tool for



bending. Length of the notcher is 8½ in.; weight 1 lb.

The snap-lock punch is capable of producing uniform ears which snap under and lock firmly on the seamed edge of a joining piece. This tool is especially valuable for fabricators specializing in duct and furnace work, because it eliminates special dies and heavy presses needed for shop punching of ears in sheets. The punch has a capacity

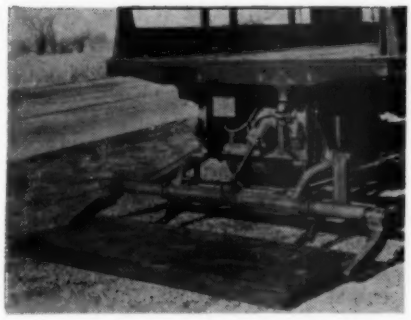


up to 20 ga in mild steel. Length and weight of the punch are the same as those of the notcher.

Whitney Metal Tool Co., Rockford, Ill.

Tailgate Lift 109

A simplified hydraulic tailgate lift, especially recommended to the heating contractor for handling furnaces, is capable of lifting 2,000 lbs from ground to 50 in., or any intermediate height, in 10 seconds.

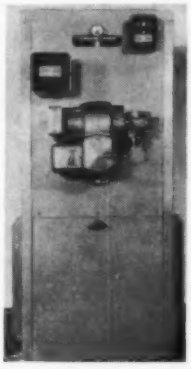


The gate descends by gravity and stops automatically upon touching platform, curb, or ground. There are no chains or protruding mechanisms on the unit, and full ground clearance is maintained because the entire installation is above the clearance point of a truck axle. It can be mounted on any standard truck of 1½ ton, or larger, capacity.

The Heil Co., Milwaukee 1, Wis.

Hi-boy Oil Furnaces 110

Gas and oil fired utility warm air furnaces, styled as hi-boy models, are available in five sizes with bonnet outputs of 60,000, 80,000, 100,000, 120,000, 150,000, and 180,000 Btu's. More compact than the usual hi-boy model, dimensions of the furnaces range from 20 x 20 x 54½ to 24 x 24 x 56-3/16 in. Unusual compactness results from parallel spacing of the plate type flues within the unit. Corrosion resistant alloy steel of double the usual thickness is used for all flues.



The furnaces are equipped with a high pressure atomizer type oil burner which is powered by a 1/12 hp motor.

Fairbanks, Morse & Co., Rm. 707, Chicago 5, Ill.

Handy Heating Calculator . 111

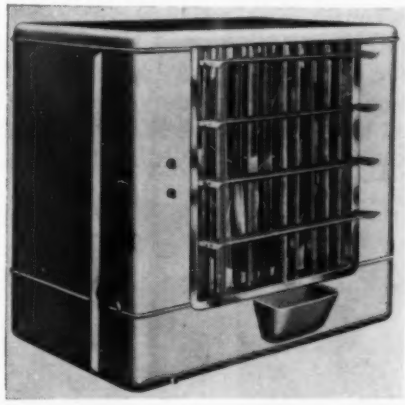
A heating calculator, now available, provides accurate and quick answers to heating system problems, complete design information for warm air, blower, and gravity systems. The front of the calculator is used to determine the Btu loss per hour and includes scales which involve dimensions of space considered, heat leakage factors, air changes per hour, air leakage factors, and temperature differences.

The back of the rule shows the Btu loss per hour and direct readings, simultaneously, for gravity, first floor, second and third floors, plus percentages for exposure factor, and cubic feet of air per minute required to supply the Btu loss per hour. Required area of duct and equivalent diameter can also be found by a simple manipulation.

Calculator Specialties Co., 122 S. Michigan Ave., Chicago, Ill.

Window Fan 112

Window fan, Model W-24, is being marketed under the trade name of Chill Air. Its advantages include

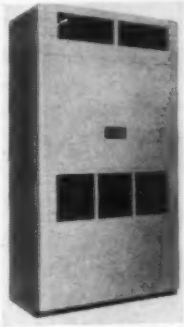


ease of installation, long life, and quiet operation. Fan size is 24 in. Dimensions are 31 in. wide, 27 in. high, and 12 in. deep. Available in baked enamel finish.

National Engineering & Manufacturing Co., Kansas City, Mo.

Packaged AC Unit 113

Several improvements have been incorporated in a line of 3 and 5 ton upright store conditioners. Each conditioner is a completely packaged, pre-engineered unit, ready for operation as soon as electrical, water supply, and drain connections are completed.



The unit functions as a complete air conditioning system by cooling, dehumidifying, circulating and filtering air. It can also be converted for use as a heating unit in winter air conditioning. Other advantages are its ease of operation and compact size.

Cabinets are finished in neutral gray-green textured enamel.

United States Air Conditioning Corp., Minneapolis 14, Minn.

Metal Hardening Compound 114

A new hardening compound called "Hi-Speed-It" is said to harden a variety of metal tools, any carbon or high speed steel to any desired depth in a few minutes.

The hardening process is a simple matter. The metal to be hardened is heated until red hot, then dipped in the gray powder. After 15 to 30 seconds, the object is again dipped in the compound, reheated, and quenched in clean, cold water. Depth of hardness is controlled by repeating the first four steps before quenching.

The compound contains no cyanide or other producer of toxic fumes. Complete instructions are printed on every can and drum.

Wilson Carbon Co., Inc., 60 E. 42nd St., New York 17, N. Y.

Electric Drill 115

A ¼ in. electric drill, compact and sturdy, is designed for production work wherever a light-weight, small size drill is required. It is built with

surplus power for drilling in metal, wood, and composition material and can be used at full load for continuous drilling without stalling. Speed is 1,800 rpm, no load; 1,100 rpm, full load.

Construction features include aluminum alloy die cast housing, helical gears, trigger type switch with locking device, and rubber covered cord, three wire with ground connection.

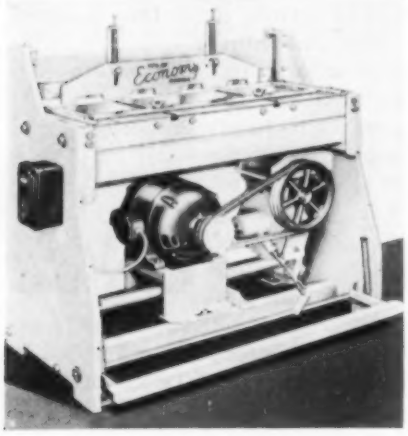
Stanley Electric Tools, New Britain, Conn.

EQUIPMENT DEVELOPMENTS

Use Coupon on Page 125

Power Shear.....116

Power operated 16 ga capacity metal shear incorporates a self-contained positive action and direct drive unit. It is illustrated below with the front guard removed.



The new Economy P-16 shear eliminates flywheels, brakes, fast moving shafts and cam operated connecting rods by utilizing the direct drive. The drive unit, which runs in oil, consists of precision cut hardened steel worm and bronze worm gear units, sliding 4-jaw clutch, driver and cam, which gives the shear a positive, direct action at a slight pressure on the foot treadle. One complete revolution is accomplished each time the foot treadle is depressed.

Operating cycle of the shear is 60 strokes per minute, which can be varied, if desired. Available in three cutting lengths, 36 in., 42 in., and 52 in., the shear is powered by a 2 hp motor in the 36 in. model, and by a 3 hp motor in the larger models.

Acme Equipment Co., Inc., 126 S. Clinton, Chicago, Ill.

Insulating Tape.....117

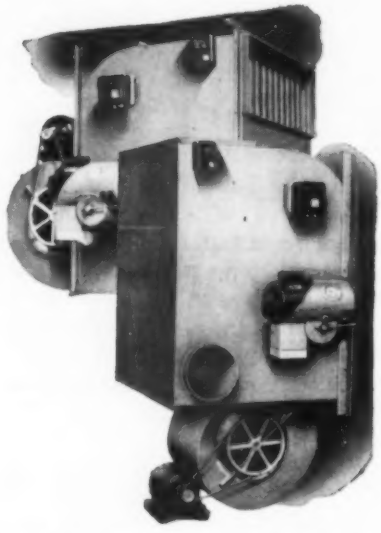
New electric adhesive tape, No. 163, is said to exceed ASTM standards in more than eight ways. It is notable for its bulk-free insulation qualities, resulting from its high dielectric strength (2,000 v.), combined with exceptional thinness. The manufacturer also claims this

tape has a higher tack, is easier to unwind, is cleaner and non-fraying, and sticks to any clean, dry surface.

Bauer & Black, Industrial Adhesive Tape Dept. F, Chicago 6, Ill.

Suspended Furnace.....118

Sturdy, compact construction permits easy hanging of these forced air heating units designed for ceiling and wall type installations. They are fired by a gun type oil burner using high heat-resistant stainless steel combustion chamber.



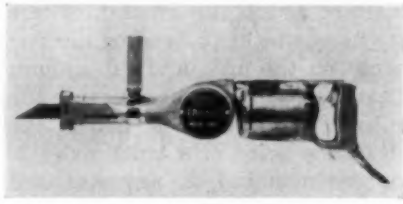
A full range of models suitable for installation in all sizes of buildings from small shops, stores, and offices to large factories and warehouses are available. Ratings range from 141,000 to 705,000 Btu input.

Tjernlund Mfg. Co., St. Paul 8, Minn.

Gun-Type Saw.....119

A newly developed reciprocal gun type saw is a modern and versatile tool which will cut through any material from rubber to stainless steel. Its value has been proved in a wide variety of operations in sheet metal fabricating plants, in air conditioning and heating installations, and for general maintenance work.

Stroke is adjustable up to a full 2 in. Special guides for various blade widths, from ½ to 1 in. eliminate whipping or snapping of the blades; these guides are also used as gun sights in following a line. The tool is equipped with special guides for various blade widths and with a handle which can be adjusted for ease of cutting at various angles.



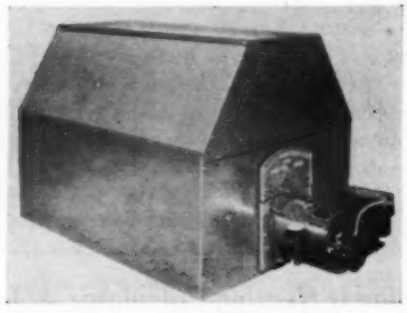
The unit will swivel 360 deg. and lock in any cutting tangent.

The saw can be driven by electric drill, an air drill, or a flexible shaft.

Transa Inc., Dept. AA, Gateway Bank Bldg., Minneapolis, Minn.

Under-Floor Furnace.....120

Small, compact, oil or gas fired heating units are now available for installation under the floor in basementless homes. The heater, known as Comfort-aire, is only 32 in. high, 26 in. wide, 39 in. overall length including the burner. It can be suspended from floor joists or set on a cement or brick footing. Although designed for under-the-floor installations, these units can also be hung from the ceiling or mounted on a wall platform. Floor installations require less than 10 sq ft.



With a ⅙ hp blower motor, the unit delivers 55,000 Btu's at the bonnet; with a ¼ hp motor, 65,000 Btu's. Maximum fuel consumption is 1 gal. per hour; minimum, 1/12 gal. Both horizontal and vertical models of these units are available.

Heat Controller, Inc., Addison, Mich.

Advertisement

Convertible Heating Equipment Key to More Sales with Less Inventory

E. J. LATTNER, President
Century Engineering Corporation
Cedar Rapids, Iowa

ONE of the problems besetting a dealer of almost any type of equipment is the matter of inventory. Trying to cover all contingencies would normally require a prohibitive amount of stock . . . . both from the cost and space standpoints. No dealer likes to turn away a prospect because he has not the type or size equipment needed. This has been one contributing reason why dealers have been showing increased interest in equipment that could be used for either oil or gas firing.

A convertible type heating system is the obvious and ideal solution. This interest has been further increased by violent fluctuations in the availability and comparative prices of various kinds of fuel, promises of additional natural gas for home heating, widespread building activity, and the need for additional sales features to help offset customer resistance to the present high cost of new homes.

Heating dealers have an outstanding opportunity to sell more automatic heating equipment for new home construction, provided they have equipment that can be easily and economically converted to oil or gas heating as conditions demand. To the person building to occupy, the dealer can point out that the installation of a convertible furnace would add only about $1 or $2 to the monthly financing payment as compared to a hand-fired furnace. It will be easy to convince him that the convenience, cleanliness, and uniformity of automatic heat is more than worth this nominal amount.

To the contractor building to sell, the dealer can show him how he has an added powerful selling feature to help him sell the house. By emphasizing how he has provided for the future as well as the present convenience of the prospective buyer, through the installation of a convertible furnace, he will build confidence in his entire home construction dealings.

The choice of heating fuels is somewhat a personal matter. Even though a person builds to occupy, circumstances may require that he later sell, for one reason or another. He will find in such a case that it is far easier to sell his home if the heating unit can be fired either by oil or gas by simple convertibility.

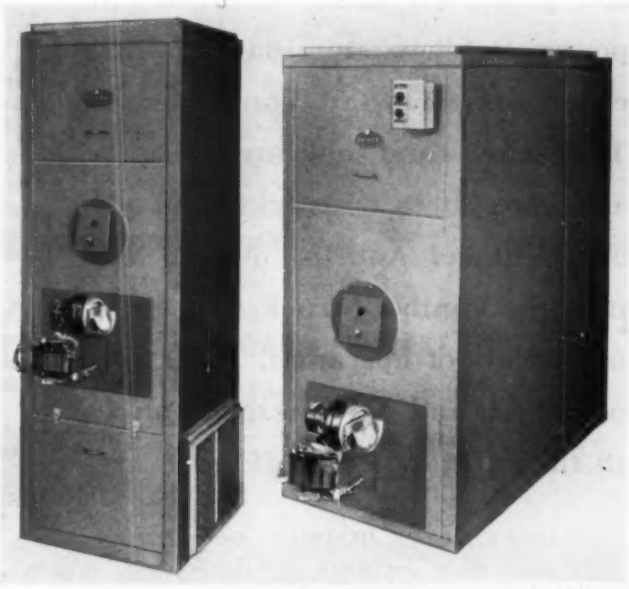
There is another convertible feature that is important. The home owner has greater freedom from price squeeze on fuel. If for some reason the type of fuel he uses should get out of hand either pricewise or as to supply, with a convertible furnace he can easily change to oil or gas as the occasion demands.

Authoritative reports from the building field indicate that lower-cost homes, including multiple-unit projects, garden-type and duplex apartments, and the so-called "economy house," are figuring much more prominently in builders' plans than ever before.

Heating dealers, to keep sales volume up, must be prepared to exploit this market with convertible automatic heating equipment which has the versatility that will appeal to those building *to occupy*, as well as to those who are bulding *to sell*. This equipment must be attractive from a price standpoint (remember: your biggest market is comprised of lower-cost homes); it must be compact in size for installation in small basements, first-floor utility rooms, kitchens and even closets; it must be soundly engineered to provide completely automatic heat with full economy and maximum safety; it must be designed to operate quietly where noise would be objectionable, such as in a kitchen or utility room; and, (to make it possible for the dealer to appeal to the widest possible market with a limited inventory), this equipment should be adaptable in its ability to utilize the two most-wanted types of automatic fuel . . . oil or gas.

Convertible heating equipment that meets all these requirements . . . and more . . . is now available from Century Engineering Corporation, Cedar Rapids, Iowa. The new line has been appropriately named the "Century Convertible" and is available in both hiboy and loboy styles, with interchangeable oil and gas burners. The sizes permit dealers to sell equipment for both small and medium size homes, where the big sales volume will be found this year. The hiboy with a Century power vaporizing oil burner has a bonnet rating of 60,000 BTU, and the loboy, 80,000 BTU. The same furnaces when equipped with the Century gas burner have an input rating of 60,000 BTU for the hiboy and 100,000 for the loboy.

In every respect, the New Century Convertibles are outstanding. More than 25 years of Century experience in building fine quality automatic heating equipment has gone into their design and construction. With the Century Convertible line, dealers can satisfy every small-home demand for quiet, compact, economical automatic heat . . . at ground-floor, competitive prices. For illustrated literature and complete details of the new Century Convertible lines, write today to *Century Engineering Corporation, Cedar Rapids, Iowa.*



—Century Engineering Corporation Photos.

New Convertible furnaces shown with oil burners .... interchangeable gas burner fits same furnaces.

America Wants Value . . . America Buys

CHEVROLET ADVANCE-DESIGN TRUCKS

America's truck operators know that these all-star cargo carriers deliver the goods all along the line—in power, stability, stamina, handling ease, comfort and convenience. They know—and they buy and operate more Chevrolet trucks than any other make. And in owning the nation's Number 1 truck, they enjoy *lower cost* of operation, *lower cost* of upkeep and the *lowest list prices in the entire truck field!*

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICHIGAN

Chevrolet's the *Only* Truck With All These Features

NEW CHEVROLET 4-SPEED SYNCHRO-MESH TRUCK TRANSMISSION

A special feature in Series 3800 and heavier duty models that assures new operating ease and efficiency.

THE CAB THAT "BREATHES"

Here are the trucks with the famous cab that "breathes"! Outside air is drawn in and used air is forced out! Heated in cold weather.*

FLEXI-MOUNTED CAB

Chevrolet's Advance-Design Cab is mounted on rubber, cushioned against road shocks, torsion and vibration.

IMPROVED VALVE-IN-HEAD ENGINE

The world's most economical engine for its size now has greater durability and operating efficiency.

SPLINED REAR AXLE HUB CONNECTION

Greater strength and durability in heavy-duty models with this exclusive Advance-Design feature.

PLUS Uniweld, all-steel cab construction • New, heavier springs • Full-floating hypoid rear axles on the 3600 Series and heavier duty models • All-round visibility with rear corner windows* • Specially designed brakes • Hydrovac power brakes on Series 5000 and 6000 models • Ball-bearing steering • Double-line pre-selective power shift in 2-speed axle at extra cost on Series 5000 and 6000 models • Wide-base wheels • Standard cab-to-axle-length dimensions • Multiple color options.

**Heating and ventilating system and rear corner windows with de luxe equipment optional at extra cost.*

CHEVROLET

CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!

NiAGARA Gas FURNACES

Combustion chambers of cast iron or steel are included in the line of Niagara gas-fired units, both gravity models and completely automatic winter air-conditioners. Two vertical models meet the requirements for basementless homes and apartments. Vertical models are shipped as complete package units. All gas furnace cabinets attractively finished in Hammerloid enamel.

NiAGARA Coal FURNACES

Here's a really complete line of coal furnaces—round and square cased cast iron; round and square cased steel; and coal fired winter air conditioners.

NiAGARA Oil FURNACES

Completely automatic units of lasting attractiveness and dependable, economical operation with gun type pressure burners. All cabinets Hammerloid enamel.

. . . and merchandising helps

Niagara colorful folders, window signs, decalcomanias, electric signs, catalog sheets, sales portfolios, and other merchandising helps assist you in selling Niagara to your prospects.

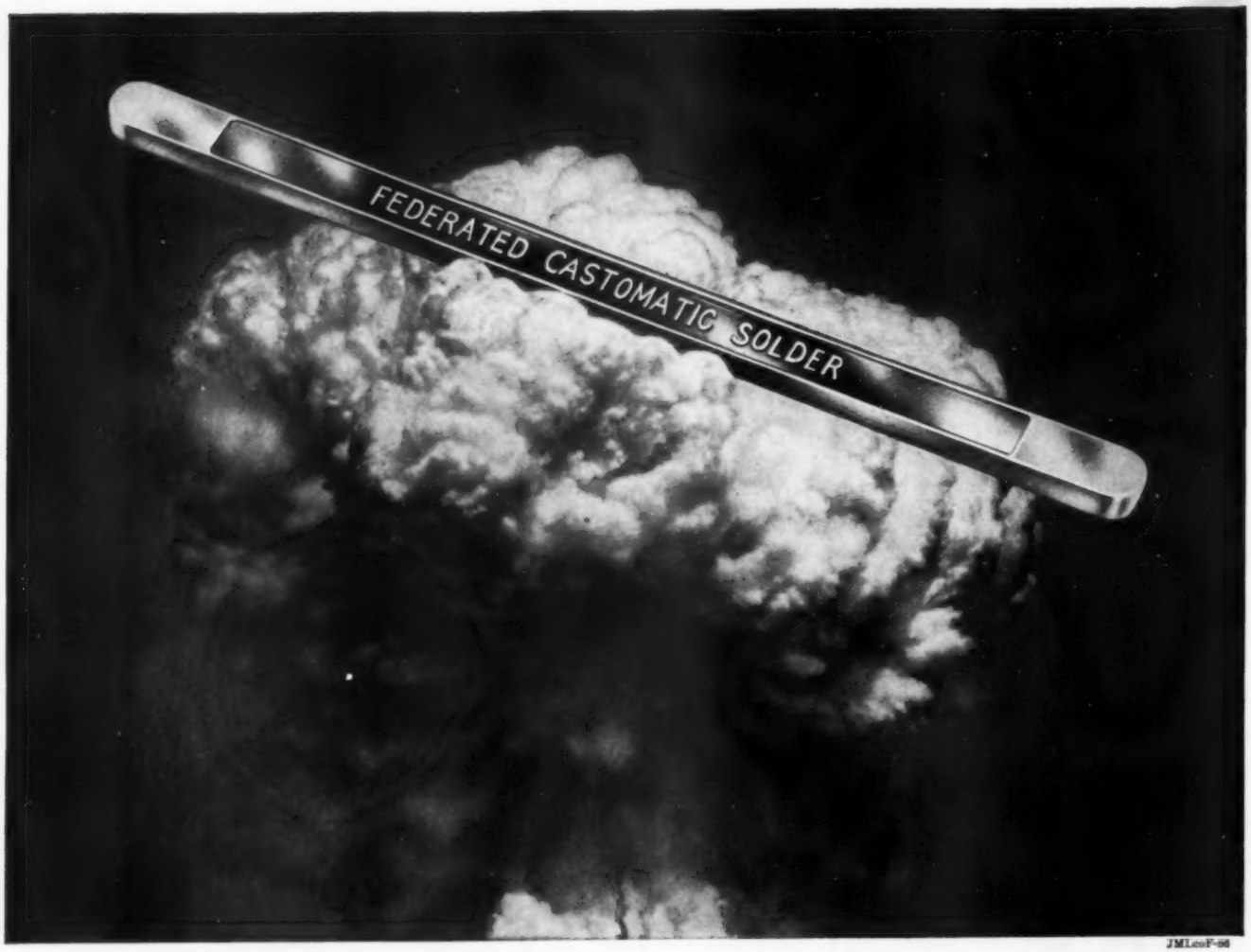
THE Niagara line is a quality line—57 years of furnace manufacturing demonstrate that the reputation of Niagara is well established.

The Niagara line is complete—gas, coal, and oil in a range of 33 sizes and models which meet any residential demand for warm air heating.

And Niagara believes that the dealer should make a profit while serving his customer with satisfactory heating at reasonable cost. Write for complete details of Niagara furnaces and Niagara merchandising helps.

NIAGARA FURNACE DIVISION
The Forest City Foundries Co.
2500 West 27th St.
Cleveland 13, Ohio

NiAGARA GRAVITY AND WINTER AIR-CONDITIONING UNITS



JMLeoF-66

CASTOMATIC—A *New* Power In Solder!

Federated Metals has developed and patented a modern machine which is producing an entirely NEW and BETTER bar solder . . . another Federated first!

CASTOMATIC solders are absolutely uniform. Automatic casting, with a continuous flow of metal under pressure from melting pot to mold, guarantees identical composition throughout the bar. This means that every portion of every bar melts at the same temperature; every bar gives the same results.

CASTOMATIC solders contain no harmful oxides because there is no exposure to the air during casting. This means better fluidity, easier work. The grain structure of all CASTOMATIC solders is extremely fine and free of voids. Surfaces are noticeably brighter and cleaner than hand-cast bars.

Buy CASTOMATIC now! In standard 1½ lb. bars; all commercial compositions. Call or write the nearest of Federated's 7 plants and 24 sales offices.

Federated first in the non-ferrous field FMD

Federated METALS DIVISION

AMERICAN SMELTING AND REFINING COMPANY, 120 BROADWAY, NEW YORK 5, N.Y.

Better Sell Superfex!

LOOK at what Superfex gives you

CHOICE of the exclusive "Homogen-Air" three-stage fire with synchronized blower*; two-stage system or gravity furnaces, either gas or oil fired.

CHOICE of basement furnaces, floor furnaces, high-boys or suspended units.

CHOICE of vaporizing or gun-type oil burners.

CHOICE of complete furnaces or conversion burners.

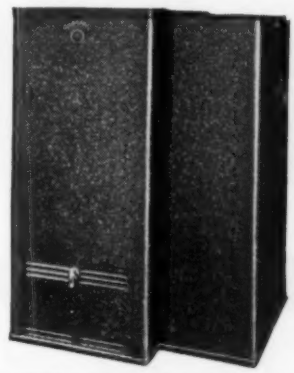
CHOICE of natural, manufactured or L.P. gas burners.

HIGHEST QUALITY CONSTRUCTION; stainless steel oil burner parts; high efficiency heat exchangers; Double-wall casings of heavy gauge steel; Sealed-to-steel baked enamel finish.

AND heating engineering service backed by the finest development laboratory in the industry.

*The Superfex "Homogen-Air" is the *only* system that *continuously* delivers the right amount of heat from a three-stage fire, and *continuously* circulates it. "Homogenized" effect of constant mixing gives even heating with never more than 4° difference, floor to ceiling. The most critical buyer likes the added VALUE in this extra comfort at less cost.

Every Season Is Your Busy Season With Superfex



MODEL 62 Gas, 100,000 BTU. Input

With this complete line, you can be GLAD that customers are getting tougher about the VALUE they get for their money. The PLUS features of Superfex, the things no other furnace has, provide Superfex dealers with the greatest heating values in ANY kind of a market.

Superfex

GAS OR OIL FURNACES

Made by PERFECTION STOVE COMPANY

7095-B Platt Avenue • Cleveland 4, Ohio

Customers getting "CHOOSEY"?

Superfex Automatic Water Heaters

Superfex full automatic water heaters, oil or gas fueled, are available in fifty or thirty gallon capacities. Center-stack heated. Heavily insulated. Superfex "Midget" Pilot saves money.

Fireite is easily applied to any clean surface

Joints stay *gas-tight* when sealed with J-M FIREITE*

● This easily-applied asbestos furnace cement air-sets or heat sets into a practically indestructible joint.

Fireite remains gas-tight against the highest temperatures, resists expansion and contraction strains. This is especially important for domestic oil burner and stoker installations—because better combustion results from gas-tight and air-tight joints.
**Reg. U. S. Pat. Off.*

Fireite Asbestos Furnace Cement is ready-mixed, ready-to-use. Easily worked, it can be applied quickly to any clean surface. Fireite is odorless. It keeps well on the bench and in the container. Fireite has minimum shrinkage, does not bloat, crumble or crack.

Use Fireite for mounting or repairing heating equipment—for setting ash pits and fire pots, doors, dampers and other places where sealing is necessary. With Fireite, there is less danger of costly call-backs for re-sealing.

WRITE FOR FREE 4 LB. SAMPLE

Let us send you a can of Fireite Furnace Cement and a copy of folder RC-7A. Simply write giving your name and the name of your company. Address Johns-Manville, Box 290, N. Y.

Johns-Manville FIREITE asbestos furnace cement

now in gleaming WHITE!

THE HESS

Climate Master*

OIL FIRED UNITS

SERIES O Climate Master furnished 3 sizes, from 105,000 to 175,000 B.T.U. High pressure oil burner. White baked enamel finish.

Smartly at Home in Recreation Rooms, Utility Rooms, and Modern Basements

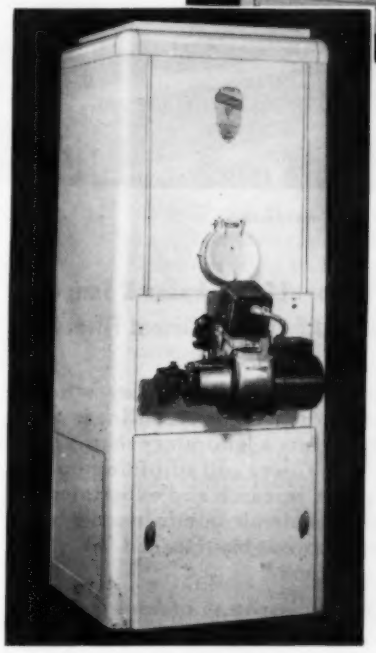
Everybody's asking for the New Hess Climate Masters*. It'll be sales at first sight when your customers see these compact, efficient, handsome heating units . . . now available in sparkling *white* baked enamel to match other household appliances and any decorative scheme. Easy to keep clean too!

And the Climate Masters* are perfectly in step with today's trend to ranch houses and other small homes. They represent the *greatest possible warm air heating efficiency*, confined in a small, compact, handsome unit that will *fit in anywhere*.

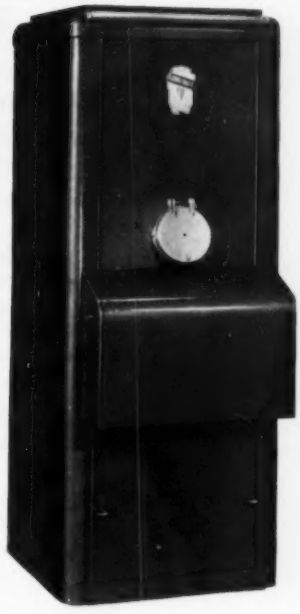
CHECK THESE CLIMATE MASTER* ADVANTAGES:

- **Available in a size and price for every purpose.**
- **Beautiful white baked enamel finish.**
- **Compact—oil burner, controls, blower, humidifier and heat exchanger—all in one complete package!**
- **Famous Hess square design welded heat exchanger means no leakage, greatest possible direct radiant heating surface for highest heating efficiency.**
- **Burners on 80,000 units are either pressure or vaporizing type. Easily accessible for service.**
- **All heating surfaces are on pressure side of blower—no heating surfaces extend into the blower compartment.**
- **All necessary controls included. Models 80-V, 80-P and 1100 are factory assembled.**
- **Can be readily converted to gas.**
- **Model 80-V meets Commercial Standards CS104-46.**
- **Backed by Hess' 76-year experience and reputation for superiority in warm air heating.**

Write today for details on the Complete line of Hess heating equipment. Capacities up to 1,200,000 B.T.U.



80-P Climate Master—with pressure oil burner. 80,000 B.T.U. Cabinet dimensions: 25¼" x 25¼" x 65". White baked enamel finish.

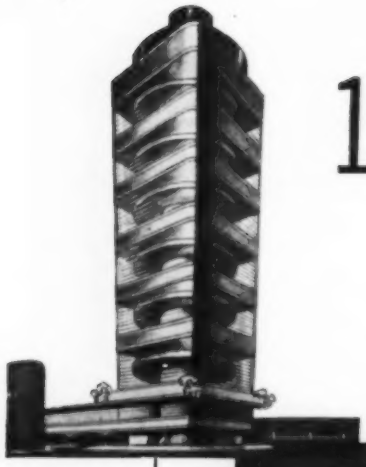


80-V Climate Master. Vaporizing burner with mechanical air supply. 80,000 B.T.U. Cabinet dimensions: 25¼" x 25¼" x 65". White or coppertone finish. (Shown in coppertone.)

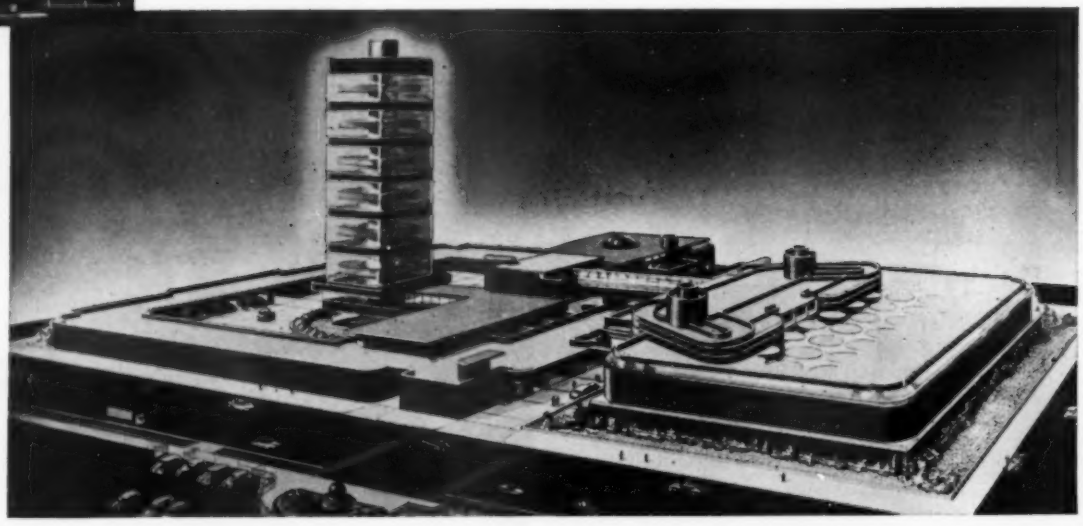
The Hess Company

our 76th year **CHICAGO 50, ILL.** **Heating Experts Since 1873**

*reg. trade mark



15 Stories of SUPER-CLEAN AIR



Research Tower now under construction.

Frank Lloyd Wright, Architect
Samuel R. Lewis, Consulting Engr., Chicago

Wax Research Tower of S. C. Johnson & Son, Inc. Equipped with AAF Electro-Airmat Filters

IT is only natural that a company whose products are dedicated to cleanliness and beauty would construct a laboratory that is free from dust and dirt. Tower and adjoining buildings making up this research and experimental unit will be completely air conditioned—with air that is first thoroughly cleaned by AAF Electro-Airmat* Filters.

There is hardly a business or industry that has not saved money by applying clean air to some phase of its operation. An auto body manufacturer eliminated scores of rejects in the body finishing department caused by specks of dirt and dust. A department store cut losses drastically resulting from soilage and markdowns. A specialty shop was able to reduce their cleaning staff and costs with the elimination of soot and dirt.

Only American Air Filter can meet this wide range of air cleaning requirements—because it is the only company offering a complete line of air filters, from the simplest throwaway unit to the high efficiency electronic types. That's why you can look to AAF for an unbiased analysis of your customers' needs.

And remember—AAF's 25 years of successful experience in engineering air filters to individual needs is yours for the asking. It can save you time and your customers money. For complete information on air filters and their application, call your nearby AAF representative or write direct to

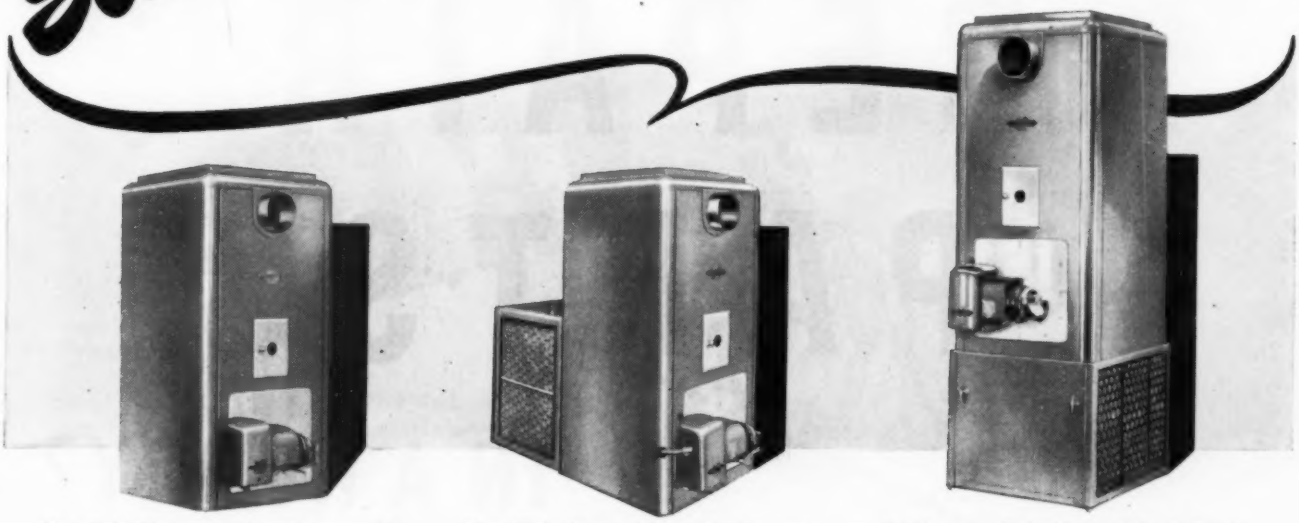
AMERICAN AIR FILTER COMPANY, INC.
355 Central Avenue, Louisville 8, Ky.
In Canada: Darling Bros., Ltd., Montreal, P. Q.

®AAF

AIR FILTERS
AND ELECTRONIC PRECIPITATORS

**Airmat is the trade-mark (Reg. U. S. Pat. Off.) of the American Air Filter Company, Inc., for various air filters, dust collectors and filtering media.*

NOW! Sell the Small Home and Builder Market with these NEW LOW-COST DELCO-HEAT CONDITIONAIRS



New Delco-Heat oil-fired gravity warm air furnace with a new and dependable vaporizing-type, forced-draft burner. A wonderful value! Now even the smallest homes can have all of the advantages of top quality automatic Delco-Heat—at low cost!

New Delco-Heat oil-fired forced warm air furnace—with (1) vaporizing-type forced-draft burner, or (2) Delco-Heat pressure atomizing burner with the exclusive "Rotopower" unit. For low-ceilinged basements and installations where head room is restricted!

Another new Delco-Heat oil-fired forced warm air furnace compactly designed for utility room and basement installations—or where floor space is limited. Available with (1) vaporizing-type, forced-draft burner—or (2) the famous Delco-Heat pressure atomizing burner!

Here are five brand new Delco-Heat oil-fired Conditionairs—especially engineered to meet the requirements of small home owners and builders! Five new Conditionairs—in both gravity and forced warm air models—with either vaporizing forced-draft or pressure atomizing-type burners! They're easy to install, easy to service—and because all models have the same "basic unit" construction, they're economical for you to stock!

Most important—these new Delco-Heat Conditionairs, with their many outstanding features, will give your *value conscious* customers exactly what they want in automatic home heating . . . dependability, comfort, convenience and economy!

These new Conditionair models are perfect companions to the other great Delco-Heat products—conversion Oil Burners, oil-fired Conditionairs, gas-fired Conditionairs, oil-fired Boilers, automatic Coal Stokers, and oil and gas-fired Water Heaters. Now the Delco-Heat line is more complete, more valuable than ever. Now, when you sell Delco-Heat—a real General Motors' value—greater profits can be yours, because:

1. You'll be selling a name that's a household word—a name synonymous with *value*.

2. You'll have a complete line of oil, gas and coal-fired home heating units.

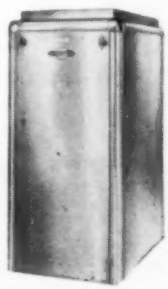
3. You'll be backed by research and engineering that will keep the products you sell out in front.

4. You'll have the help of an advertising and sales promotion program that *really works!*

For full information about the advantages of a Delco-Heat franchise, write to Delco Appliance Division, Dept. AA-6, General Motors Corporation, Rochester 1, N. Y.

GENERAL MOTORS DELCO-HEAT

Your Keys to Greater Profits



Delco-Heat Conditionair (Oil or Gas-fired)

Delco-Heat Conversion Oil Burner

Delco-Heat Oil-fired Boiler

Delco-Heat Automatic Stoker

Manufacturers of Delco Water Systems for farms and homes—Fractional Horsepower Electric Motors—Electric Automobile Clocks

NEED REPAIR PARTS* IN A HURRY?

Try

NORTHWESTERN

All makes of Stove

Furnace and Boiler

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STOVE REPAIR CO.

662 West Roosevelt Road

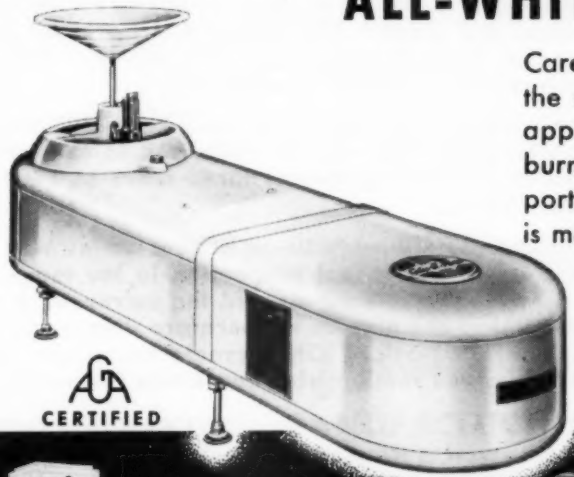
Chicago 7, Illinois

SALES SOAR!

WITH

Gas-A-Fire

AMERICA'S FASTEST-SELLING ALL-WHITE CONVERSION BURNERS



AGA CERTIFIED

Carefully engineered and handsomely styled by one of the oldest, most reliable firms of heating engineers. The appearance, performance and efficiency of the *Gas-A-Fire* burner insures satisfied customers everywhere. Your opportunity to obtain soaring sales as more and more gas is made available.

Nationwide acceptance-Sold in every large city in America!

Automatic Firing Corporation
6506 OLIVE BLVD. ST. LOUIS 5, MO.

Without obligating me in any way, please send me full information on the Automatic Firing Corporation franchise.

NAME _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

Automatic Firing Corporation
6506 OLIVE BLVD. ST. LOUIS 5, MO.

This is DUX-SULATION —the All Purpose Insulation for All Bare Metal DUCT LINES!

- **for Summer Cooling**
- **for Air Conditioning**
- **for Heating & Ventilating**
- **for Mechanical Equipment**

DUX-SULATION Earns Good Will and Profits!

A Neat and Trim DUX-SULATION Job

Right now there's a lot of building, plant remodeling and new home construction work going on everywhere. Many of these jobs have DUX-SULATION specified for the bare metal duct work. Every long-run and every run in an unheated area is your opportunity for new and profitable business! Do the job right and cover the ducts with this all-purpose insulation for greater efficiency, summer and winter! DUX-SULATION works all year around. It is easily applied because it's flexible—it covers fittings, flat and irregular surfaces. It stays put!

Those Air-Conditioning jobs coming up must have DUX-SULATION for top efficiency. You may be surprised to know that a DUX-SULATION insulated system is three times as efficient as one with bare ducts.

Bare ducts are definitely wasteful!—with cool air as well as warm air. This waste is in direct proportion to the temperature-difference between the duct-air and the surrounding air. The greater the inside and outside temperature difference, the greater the waste. DUX-SULATION corrects this waste once and for all. It gives you the Register and Grille temperatures you want.

DUX-SULATION IS NOW AVAILABLE—PROMPT SHIPMENT.
ORDER FROM YOUR LOCAL HEATING SUPPLY HOUSE.

Write for Bulletin No. 406-A and get the full story!

NEW YORK AREA—
AIR CONDITIONING UTILITIES CO.—NEW YORK 18.

PACIFIC COAST—
PLANT INSULATION CO., LOS ANGELES 11.
PLANT ASBESTOS CO., SAN FRANCISCO 7.

ASBESTOS SUPPLY COMPANIES—
SEATTLE 4,—SPOKANE 2, TACOMA 2,—PORTLAND 4.

CANADA—ATLAS ASBESTOS CO., LTD.—
MONTREAL 1,—TORONTO—WINNIPEG—VANCOUVER.

GRANT WILSON, INC.

Board of Trade Bldg. CHICAGO 4, ILL.
141 W. JACKSON BLVD. AT LA SALLE ST.

ASBESTOS PAPER	ASBESTOS MILLBOARD	FLEXIBLE DUCT CONNECTIONS
FURNACE CEMENT	PIPE COVERING	
PIPE JOINT TAPE	BOILER CEMENT	BOILER & TANK INSULATION
COLD WATER PASTE	ASBESTOS SPECIALTIES	

New

New OUTSTANDING VALUES!

+ *Lower* SURE-FIRE PRICES!

= *Bigger* FASTER SALES FOR YOU!

UTILITY ROOM AIR CONDITIONER. 65,000 BTU/Hr. Under 5' high, occupies little floor space, fully automatic, oil pressure burner, primary and secondary heat exchangers, blower, filter, humidifier (optional), finish metallic grey.

New

WINTER AIR CONDITIONERS. Four units from 85,000 to 200,000 BTU/Hr. Fully automatic, oil pressure burner, heavy-duty blower, oversize filters, humidifier, primary and secondary heat exchangers, finish beige and green.

OUTSTANDING NEW VIKIMATIC FURNACES—at lower prices but same high quality—mean faster selling, quicker profits *for YOU!*

Start selling these RIGHT NOW! They're grand new profit-makers for you. They're new additions to the well-established VIKIMATIC line. They're *lower-priced,* but maintain VIKIMATIC's high standards of construction, styling, performance. And, with addition of FLATPAK Preformed Aluminum DUCTWORK, you obtain sensationally lower-priced *complete heating systems!*

This adds up to FASTER SALES FOR YOU! So don't miss the opportunity. Start selling them RIGHT NOW! The market's there—be sure you get your share! Write today for full details.

WRITE AT ONCE! It will pay you to write, wire, or phone promptly for full details. Ask, too, about exclusive franchises!

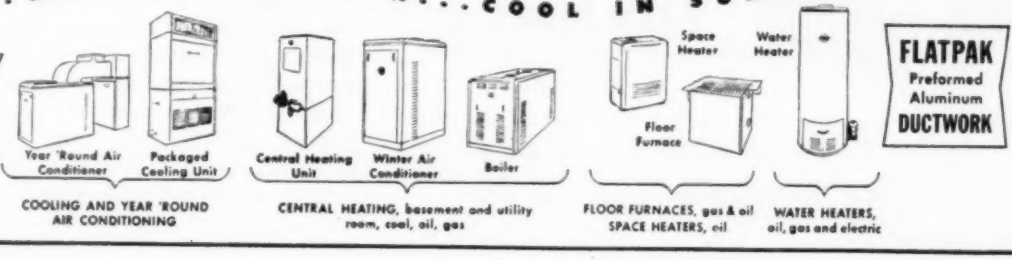
GAS COMING! These fine new VIKIMATIC models are available now only in oil. However, gas units are being added. Order ahead for these now!

THE VIKING MANUFACTURING CORPORATION • CHerry 5500

1747 Chester Avenue, Cleveland 14, Ohio

. . . WARM IN WINTER . . . COOL IN SUMMER . . .

VIKIMATIC



COOLING AND YEAR 'ROUND AIR CONDITIONING

CENTRAL HEATING, basement and utility room, coal, oil, gas

FLOOR FURNACES, gas & oil SPACE HEATERS, oil

WATER HEATERS, oil, gas and electric

NOW . . .

a TRULY Forced Air

INN-A-WALL

. . . and you can employ duct work where necessary!

Yes, sir . . . here is *the* answer to heating properly small homes without basements. Security's INN-A-WALL is an entirely new principle in forced air heating! Requires minimum duct work . . . may be used without ducts. Needs only 16 by 20-inch floor area.

The INN-A-WALL reverses the usual flow pattern . . . warm air comes out the *bottom*. This means *warm floors!* Warm air can be taken from all four sides . . . return air, from all sides at the top. Where ducts are required for distant rooms, permanent connection is made at the bottom. Completely assembled . . . ready to install. Casing height, 88 inches. Security breather tube automatically supplies air for combustion.

Other outstanding INN-A-WALL values are • Quiet, positive blower • Fully automatic • Special Security high-efficiency burners • Complete adaptability to any floor plan (may be placed in wall or stand alone) • Amazingly economical in price.

SECURITY

Automatic, Gas-Fired

INN-A-WALL FURNACE

Write Today . . .

don't delay. Get all the facts about this revolutionary new furnace.

SECURITY MANUFACTURING CO.

1630 Oakland St. Kansas City 3, Mo.

NEW LITERATURE

Use Coupon on Page 125

Aluminum Finishes 256

Finishes for Aluminum, a technical manual, furnishes basic information on the various processes for applying surface finishes to aluminum, and describes the characteristics of the finishes so produced. This publication, which is a revision of a two volume book published under the same title in 1946, brings the subject up to date and combines the two volumes into one handy reference book.

The new book includes chapters on characteristics and properties of aluminum, cleaning treatments, mechanical finishes, chemical treatments, electrolytic oxide finishes, controls, and tests. It is complete with table of contents, itemized cross index, and index of tables. The present revision was made by Jules F. Saut and Harlan D. Jones, under the supervision of Dr. George Perkins, Director, Technical Service, Reynolds Metals Company.

Finishes for Aluminum contains 124 pages, 37 illustrations, 26 tables, 3 indexes, and is wire bound to lie flat when open. Trim size is 5¾ x 8¾ in.

The book is available without charge to engineers, metallurgists, finishing department foremen, and other company officials requesting it on company letterhead.

Reynolds Metals Co., 2500 South Third St., Louisville 1, Ky.

Printed Tape 257

A statement of company policy is included in a four page folder which also lists the superior features of a printed self-adhesive cellulose tape. The folder is being used as a part of the manufacturer's sales presentation and is also available to all those who have occasion to use this type of tape.

The tape has proved valuable when used for advertising at point of sale, for labeling, packaging, for name plates and instruction labels; it is also used for parts marking and manufacturing assembly production.

Topflight Tape Co., York, Pa.

Air Purification 258

An air recovery booklet entitled "A Dream of Green Air" tells the story of a worried business man who is troubled by a vision of the conditioned air in his building becoming the color of money—money which is being lost. In a narrative style, with simple diagrams, the booklet explains how much of the money spent to cool air is thrown away because the air is rendered objectionable by accumulated odors.

As a corrective measure, the booklet advocates activated carbon purification of the air, that is, recovering and recirculating the air which is already at the right temperature and humidity. By making use of this air recovery process, less conditioning capacity is needed in the air conditioning system.

W. B. Connor Engineering Corp., 112 E. 32nd St., New York 16, N. Y.

General Giant Furnace Cleaner

The GENERAL Giant Furnace Cleaner can be purchased complete with new ¾ or 1-ton Truck in pickup or stake bodies; or mounted on your own truck; or mounted on a 4' x 7' trailer; or as a power takeoff unit. There is no extra charge for mounting when completed at our factory.

- Cleans the average heating unit in one hour or less. Develops resets, repairs and new furnace sales.
- Ask about the latest development in Furnace cleaning—"GENERAL'S" Soot and Ash Interceptors.
- Our Engineering Department is at your disposal for consultation and help.
- Before you purchase furnace cleaning equipment get full information on the *Improved* "GENERAL" *Giant Furnace Cleaner. The Original Machine.*
- This new improved GENERAL Giant Furnace Cleaner is the most powerful furnace cleaning unit available. This unit creates the highest cleaning velocity through both hot and cold air ducts, as well as through chimney and combustion chamber. Built to the highest standards of engineering by the *General Blower Company* and backed by more than 25 years of experience in design and construction.
- Advertising mats, literature, etc., are available to assist you in a profitable sales and cleaning program.

WRITE TODAY!

GENERAL BLOWER COMPANY

8610 FERRIS AVE. **MORTON GROVE 6, ILL.**

Now Only $2.00 for This Outstanding Book on Air Conditioning

The Third Edition of

AIR CONDITIONING FOR COMFORT

by SAMUEL R. LEWIS

288 Pages—6½" x 9¼"—Cloth Bound

Easy to understand . . . accurate . . . comprehensive . . . these are the features of this third edition of Samuel R. Lewis' well-known AIR CONDITIONING FOR COMFORT.

Fundamentals are fully and clearly covered. Correct procedure in designing complete systems for both residences and large buildings is explained step by step. In addition, considerable original data on such subjects as standards, noise control, measurements, and fire protection codes has been included.

Send $2.00 for a copy today to the address below. We know you will consider this one of the finest air conditioning books you have yet seen, but if you should be dissatisfied with it for any reason whatever, your money will be promptly returned to you.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue **Chicago 2, Illinois**

Presenting the

New ZEPHYR Line

Portable Electric Drills

ZEPHYR 500 SERIES
½-Inch Electric Drills
No. 500.....$29.65
(With Jacobs Hex Chuck)
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Your best bet . . . either one or both

These drills are the latest in proved, streamline design. In its capacity range, each represents a big advancement in the combination of high power, quality and refinement in construction, and long-life performance. Due to the shape, size, and light weight, each offers a new handling ease and convenience that readily appeal to the user. They are your best bet for maintenance, production, and utility drilling operations.

See your supplier for complete information.

★ *Write for new Booklet on Portable Power Tools.*

PET TOOLS Portable ELECTRIC TOOLS, INC.

Fractional HP Motors • Electric Drills • Polishers • Saws • Sanders
Spin-A-Brush • Spraymaster

256 W. 79th Street, Chicago 20, Ill.

NEW LITERATURE

Use Coupon on Page 125

Hose Fittings 259

Hose couplings, hose clamps, air valves, and manifolds are described and illustrated in new condensed Catalog No. 149. Featured items are a safety-locking universal coupling, throttle valves for compressed air service, air hammer hose couplings, special high pressure couplings, and a complete line of hose clamps.

Hose Accessories Co., Philadelphia 32, Penn.

Uses of Foamglas 260

"PC Foamglas for Home Insulation" is the title of a brochure which has been published for the purpose of introducing cellular glass insulation to the residential field. Although this insulant has been successfully used for floors, masonry walls, and roofs in modern homes, and in snow melting systems for sidewalks and driveways, until now there has been no published literature from the manufacturer on these applications.

The brochure, which consists of 12 pages, includes the reasons for insulating with Foamglas, its various residential applications, and a thorough coverage of specifications for the insulant as used in these varied applications. It also includes information on physical and chemical properties as well as sizes and packing data.

Pittsburgh Corning Corp., 307 Fourth Ave., Pittsburgh 22, Pa.

Flexible Hose Products 261

Lightweight flexible hose products are described in a 12 page folder which also includes installation data and price lists. Flexaust, a spiral wire reinforced hose, which is made in sizes from 1¼ in. to 24 in. diameter, is widely adaptable and, according to the applications listed in the folder, is already in use for flexible ducting and offset elbows in air conditioning equipment and for warm air ducts in heating equipment. Some other related uses are for fume exhaust in welding and as a vibration eliminator for sheet metal ductwork.

Following the installation data is a complete section containing engineering data for Flexaust, Portovent, and Bloflex, three types of flexible hose.

American Ventilating Hose Co., New York 7, N. Y.

Oil Fired Units 262

A complete line of oil fired winter air conditioning units, marketed under the name of Oil Economy, is described and illustrated in a four page folder. A cutaway view of one of the units serves to show the internal construction, while separate views of the atomizing gun type oil burner and the heating element point up the important features of the furnace.

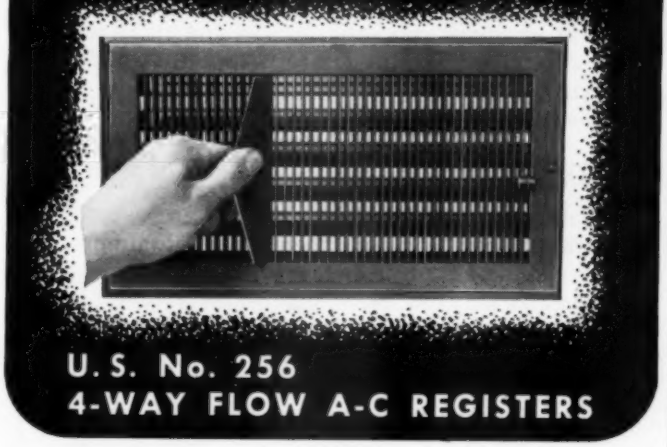
The back page of the folder contains a table of specifications as well as front and side view diagrams of the various units available.

International Heater Co., Utica 2, N. Y.

IT'S TIME TO AGAIN USE QUALITY REGISTERS

You now are not compelled to use Inferior Registers—Rid your Stock of the "Cats and Dogs" of odd-lots that you accumulated when those good U. S. Registers were not readily available. Immediate service is now yours.

U. S. No. 40 SERIES
GRAVITY BASEBOARD REGISTERS



U. S. No. 256
4-WAY FLOW A-C REGISTERS

No. 40 Series U. S. BASEBOARD excel in quality—have features not offered in other lines. No. 256 U. S. Air Conditioning Registers surpass all lines in all-around versatility and efficiency for warming and cooling air-conditioning. No. 153 U. S. Air-Conditioning Registers are positively the BEST LOW-COST Single-Valve Register made. Write for complete Catalog No. 47.

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY

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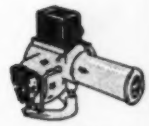

Conversion Burners

Water Heaters

Oil Fired Boilers

Warm Air Conditioners

you were among the many at the BOSTON SHOW you know why so many dealers are signing up with

GENERAL Automatic

** If you missed Boston don't miss getting the attractive proposition now open to "GA" Dealers.*

Write us today.

GENERAL OIL BURNER CORP.
2300 Sinclair Lane, Baltimore 13, Md.

HERE'S THE NEW

CHASE

THRU-WALL

COPPER

FLASHING

Five-feature FLASHING that bonds in every direction!

Chase Thru-Wall Copper Flashing gives you these *five* outstanding advantages:

1. Its saw-tooth design bonds the masonry laterally and vertically in every direction. A 3-way bond flashing at a reasonable price!
2. It quickly drains any moisture penetrating the wall.
3. It's easily formed by the sheet metal contractor.
4. It comes in 6-foot lengths—economical to install. Interlocking overlap needs no soldering.
5. It's readily available through 23 Chase warehouses and leading distributors.

Chase

the Nation's Headquarters for

BRASS & COPPER

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SALES OFFICES:

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Mail coupon for free information on features and uses.

Chase Brass & Copper Co.
Dept. AA69, Waterbury 20, Conn.

Gentlemen:

Please send me free descriptive literature on Chase Thru-Wall Copper Flashing.

NAME_____

ADDRESS_____

CITY_____ STATE_____

NEW LITERATURE

Use Coupon on Page 125

Metal Primer 263

In almost every case of paint failure, it is not the paint which is to blame but the condition of the metal to which the paint has been applied, according to a folder describing a metal primer. To eliminate this hazard in painting metal, the use of OSPHO is recommended for application directly over rusted surfaces. This primer is composed of orthophosphoric, dichromate, extenders, and wetting agents. When applied, it causes rust to change chemically to iron phosphate, an inert, hard, dark gray substance. After drying overnight, rust is stopped and paint will adhere so tightly that moisture and oxygen can no longer attack the metal.

This primer is inexpensive, cuts preparation time because rust does not have to be removed, and, in addition, lengthens the life of paint jobs.

Rusticide Products Co., Cleveland, Ohio.

Metal Finish Samples 264

To assist product designers in keeping a current file on pre-finished metals and designs, a manufacturer has prepared a handy Sampler and File Folder on a wide selection of pre-plated metals. The sampler, a four page letter size folder, contains samples of metals finished in chrome, copper, nickel and brass—available on zinc, steel, copper, brass, and aluminum bases.

In addition to actual samples—in bright and satin finishes, striped and crimped designs—complete data is given on sizes of sheets, coils, and flat strips which are available. Further information gives gauges, tempers, finishes, and properties of this line of metals and a description of special protective coatings and tints currently obtainable.

American Nickeloid Co., Peru, Ill.

Cost of Air Filtering 265

"A Comparative Study of Air Filtering Costs in Central Systems" is a four page folder containing data on the costs of air filtration, with comparative figures on installation and maintenance costs of cleanable units and replacement type air filters. A form is included for use by specification writers and others, in calculating costs for specific installations.

Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

Attic Ventilation Code 266

The second edition of the Attic Ventilation Code, published by the Propeller Fan Manufacturers' Association, is now available for distribution. This edition has been rewritten to include new material such as illustrations of typical discharge openings, method of computing areas for attic fan discharge vents, and minimum air changes recommended for attic ventilation systems in the United States.

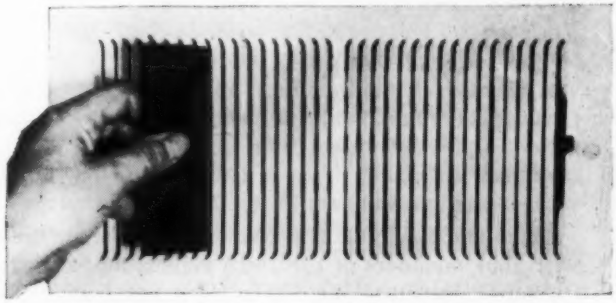
Propeller Fan Manufacturers' Association, 2157 Guardian Bldg., Detroit 6, Mich.

SHALLOW THIN-MAN REGISTER

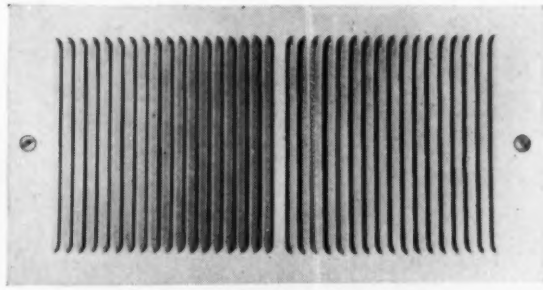
TRADE MARK

TEN DAY DELIVERY FOR STANDARD SIZES
(UNDER 100 PIECES)

DESIGNED FOR RESIDENTIAL AIR CONDITIONING



STYLE 8TM—SELECTIVE UP - STRAIGHT - DOWN DEFLECTION FROM SHUTTER. RIGHT AND LEFT DEFLECTION FROM FACE.



STYLE 8—GRILLES TO MATCH STYLE 8TM REGISTERS.

Write today for your copy of our complete catalog

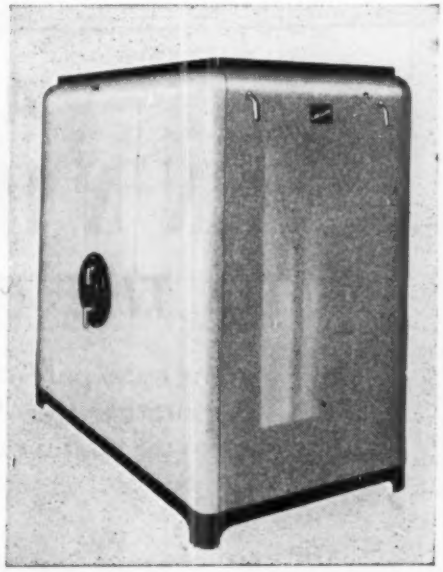
REGISTER & GRILLE MFG. CO., Inc.

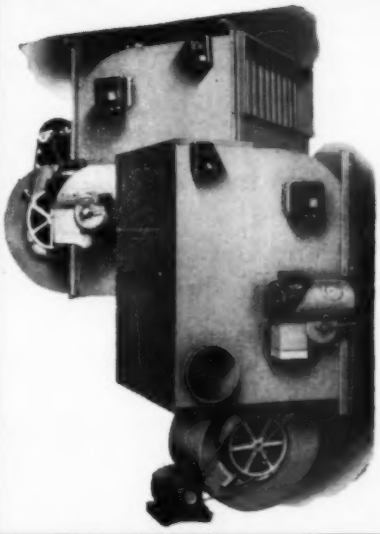
66 BERRY STREET BROOKLYN 11, N. Y.

TJERNLUND QUICK HEAT

DOMESTIC AND INDUSTRIAL HEATING UNITS

EASIER SALES AND MORE SATISFIED CUSTOMERS





The variety of models to suit practically every heating purpose makes QUICK HEAT a recognized profit builder for warm air heating dealers. Practical application of sound engineering principles combined with extensive experience has produced this highly recognized line of superior equipment. Performance and convenience of these units proves business building quality to dealers handling this line.

Overhead Units For Ceiling or Wall Mounts

READY FOR INSTALLATION

Floor units are mounted on legs to prevent rusting of bottoms and eliminate air leaks. Factory assembled in attractive casing with new type heat saver and specially designed gun type oil burner. Convenient and quick installation.

Dealers: WRITE FOR DESCRIPTIVE LITERATURE

TJERNLUND MFG. CO.

2140 Kasota Ave. St. Paul 8, Minn.

WITH THE CONTRACTORS

May 30 was a happy day for Mr. and Mrs. Harpring

MR. AND MRS. CHARLES H. HARPRING of Louisville, Ky., celebrated their golden wedding anniversary on May 30th. To make the occasion a gala one, the couple attended a church celebration in the morning, and entertained their family, relatives, and friends at a reception in the evening.

Mr. Harpring has been in the roofing and sheet metal business for 45 years. For the past 11 years, his shop has been located at 640½ E. Ormsby Avenue in Louisville. The Harpring shop specializes in heating and ventilating work and, in addition, handles all types of roofing and guttering jobs.

Mr. and Mrs. Harpring have a family of seven—four sons and three daughters. Three of the sons are now following the roofing trade.

AN IMPRESSIVE BROCHURE has recently been issued by Emil Steinhorst & Sons, Inc., of Utica, N. Y. It presents a review of the origin of the company, its subsequent growth, and discusses the wide field of sheet metal products the company now has to offer.

With a small capital, Emil Steinhorst, Sr., founded his own sheet metal shop in 1908. In 1920, the company was incorporated under its present title, and the business grew so rapidly that, in 1922, a two story building was erected on Mohawk St. in Utica.

Since the death of the founder, five sons, together with four members of the third generation, are carrying on the business. In the modern sheet metal shop, the Steinhorst company is equipped to design, fabricate, and install every type of sheet metal work made of stainless steel, monel, copper, brass, lead, galvanized and hot rolled steel, and cold rolled steel.

Contractors are invited to write and tell us about their new shops, new locations, new store fronts, display windows, changes in management, etc.

An Important

ANNOUNCEMENT

TO THE ENTIRE HEATING TRADE:

In the early part of the late war, The Homer Furnace and Foundry Corporation was forced to withdraw from the manufacture of warm air heating equipment after 35 years of activity. This was due to the tremendous demand upon our facilities for war materials.

We are now happy to announce our resumption and return to the manufacture of an outstanding line of Warm Air Furnaces, consisting of Automatic Oil, and Gas-Fired Air Conditioning units, together with Coal-Fired Steel Gravity and the good old Original Homer Cast Pipeless Furnace.

We invite inquiries from both old and new dealers, and we will also be pleased to hear from responsible Manufacturers Representatives.

HOMER FURNACE & FOUNDRY CORP. • COLDWATER, MICH.

You get — COMPLETENESS AND DEPENDABILITY WITH Profit

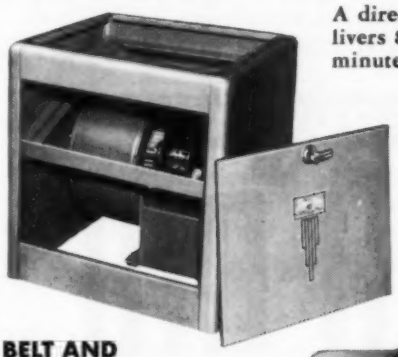
IN Peerless Electric

PACKAGE UNITS AND BLOWERS

● Peerless Electric blowers and package units are manufactured *complete* in the Peerless plant. Peerless is *not* an assembled line.

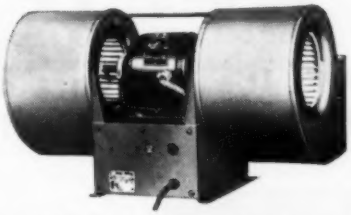
Peerless equipment is *dependable*—you minimize service worries because Peerless equipment is designed and engineered from 56 years experience in producing quality electrical apparatus. And you'll find that Peerless blowers and package units are priced right to earn a profit for you. Write for detailed information.

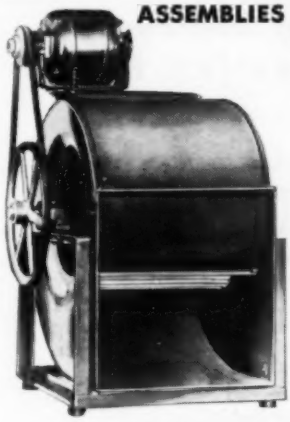
PEERLESS ELECTRIC AIRBOY BLOWER ASSEMBLY



A direct drive blower that delivers 850 cubic feet of air per minute. 3-speed blower with motor blower unit rubber cushioned. Blower wheel dynamically and statically balanced. The two motor bearings are the only bearings in the unit. Also supplied with cabinet and air filters as a complete package unit.

BELT AND DIRECT DRIVE BLOWER ASSEMBLIES



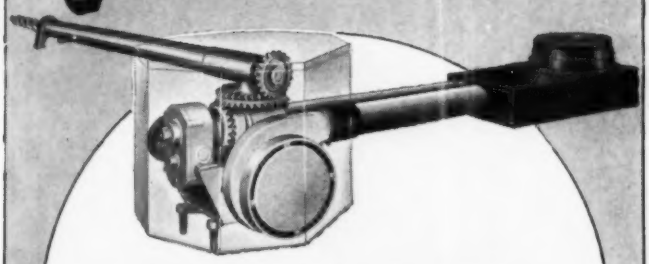


You'll find Peerless blower assemblies in many nationally-sold air conditioning furnaces of the finest quality. We furnish both of these assemblies ready to install in your own furnaces or cabinets. The many fine construction qualities of these blowers add valuable sales features to your heating units.

THE PEERLESS ELECTRIC COMPANY
ESTABLISHED 1893 • WARREN, OHIO

Peerless Electric
MOTORS • FANS • BLOWERS

NEW!



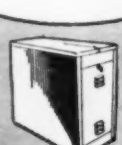
BITUMINOUS FURNACE TENDER

Universal Binfeed

Now for the first time ANCHOR offers a bituminous universal binfeed model stoker. The *new* FURNACE TENDER is designed to handle bituminous coal *automatically* from coal bin to furnace bowl. The *new* FURNACE TENDER completely satisfies all present day heating requirements — comfort, convenience, economy! Conveyor tubes are adjustable in *any* direction . . . worms are of long-life stainless steel . . . transmission is silent . . . and the *new* straight shear pin can be instantly, easily replaced. All these and many other *new* sell-able features are found in the new bituminous FURNACE TENDER.

Choice franchises now open! For descriptive literature of this or any of the ANCHOR complete line of heating equipment, write Anchor Division, Stratton & Terstegge Co., Inc., P. O. Box 311, New Albany, Indiana.

OIL BURNER


DOMESTIC BOILER

OIL FIRED FURNACE

GAS FIRED FURNACE

COAL FIRED FURNACE

ANTHRACITE AND BITUMINOUS STOKER

ANCHOR
America's Finest Heating Equipment

INDUSTRY ITEMS

WINNER OF THE $1000 CONTEST to name the evolutionary new Ko-Z-Aire conditioning unit, has been announced by Jones & Brown, Inc., Pittsburgh.

Richard F. Shoemaker, 1136 South Peoria St., Tulsa, Oklahoma, who operates his own warm air heating and air conditioning business, took the top award for the name "Hot Scot."

Mr. Shoemaker receives his $1000 prize check from a Tulsa reporter.

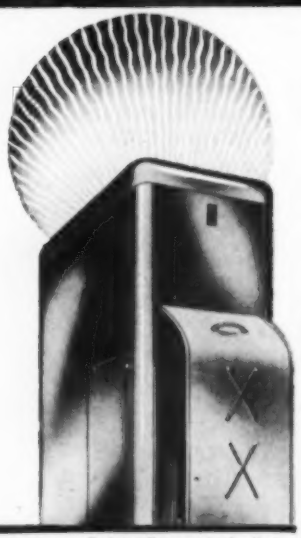
Mr. Shoemaker's 25 word statement accompanying his prize-winning name said: "A good name for this product must give two main ideas to the buyer: first, Heat; second, Economy of cost, of operation."

Jones & Brown, Inc., distributors of Ko-Z-Aire conditioning units, expressed their appreciation to the many hundreds who suggested names for the compact 250-pound heating unit.

EDWARD H. PAUL has resigned from Clayton & Lambert Mfg. Co., and established his own business. The Edward H. Paul Sales company will be located in Middletown, Ohio and will represent manufacturers of heating equipment in a territory including Ohio, Kentucky, Indiana, Michigan, northern West Virginia and northern Pennsylvania. A sales staff is being formed to efficiently handle the territory.

ANNOUNCEMENT HAS BEEN MADE by Homer Furnace and Foundry Corporation of its resumption of manufacture of a complete line of warm air furnaces. Included are automatic oil and gas fired air conditioning units, as well as coal fired steel gravity, and the original Homer cast pipeless furnace. The Homer concern was forced to withdraw from production of warm air heating equipment during the war, after 35 years of activity. The management invites inquiries from old and new dealers as well as manufacturers representatives.

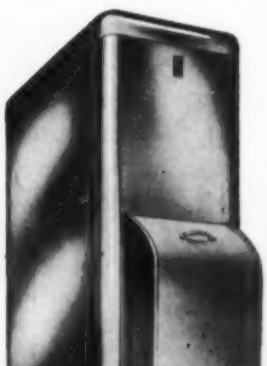
WHEN YOU THINK OF HEATING EQUIPMENT—



Remember

XX CENTURY ZEPH-AIR

With It's 54 Years of Engineered Efficiency in The Heating Field



OIL Quiet, Economical, Space Saving, Zeph-Air Oil Burning Furnaces, Easy To Operate, Easily Installed.

GAS Completely Automatic Air Conditioned Gas Furnaces With The Famous Gear Shaped Cast Iron Radiation Surfaces.

COAL You Buy Quality In Zeph-Air Coal Furnaces. No Costly Service Calls To Worry About.

It Pays To Push Zeph-Air Heating Products — Thousands of Satisfied Users All Over The Country Remember The Dependability And Reliability Their Zeph-Air Furnaces Stand For.

When a Zeph-Air Furnace Has Ended Its Long-Life and Is Ready To Be Replaced — The Customer is Almost Sure To Say — "Years of Uninterrupted Service," "Install Another Zeph-Air."

Cash In On This 54 Years of Customer Satisfaction — Stock Up On Zeph-Air Heating and Weather Conditioning Equipment — Now.

THE XXTH CENTURY HEATING & VENTILATING CO.

96 IRA AVENUE AKRON, OHIO

IS THE *Last Day* TO ENTER *MicroRold's*®

$500 PRIZE CONTEST

All entries in the $500 prize contest being sponsored by the Washington Steel Corporation for suggestions for new uses or applications of MicroRold stainless steel in gauges .015 or thinner must be in the mail on or before June 30, 1949. But that still leaves you plenty of time to enter and win.

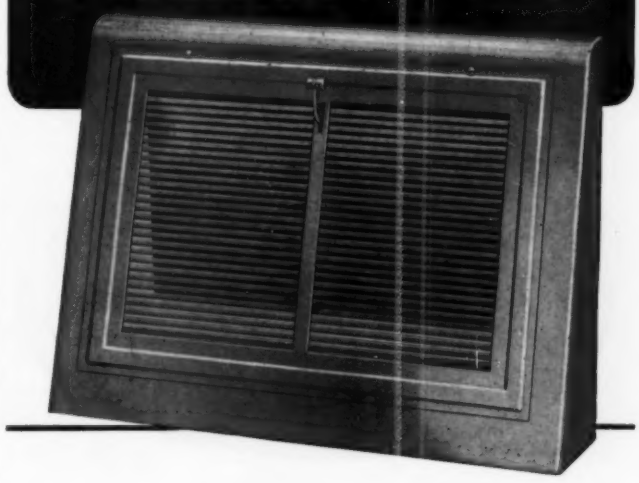
Judges of the contest, whose decision is final, are: Dr. V. N. Krivobok, International Nickel Company; Richard E. Paret, American Iron and Steel Institute; and John M. Campbell, Campbell Stainless Products Co.

CONTEST RULES

1. Entries will be judged on the basis of economic practicability and originality. All entries must be submitted on contestant's company letterhead, and each contestant may make as many entries as he desires.
2. First prize is $250, second prize $100. There are ten additional prizes of $15 each.
3. By submitting an entry each contestant grants to Washington Steel Corporation the non-exclusive right to promote the manufacture and sale of any article or idea contained in the entry.
4. Contest closes at midnight, June 30, 1949, and all entries must be postmarked on or before that time. Winners will be notified by mail on or before July 31, 1949. Duplicate prizes will be awarded in case of ties.
5. Employees of Washington Steel Corporation and its advertising agency and members of their families are ineligible. The contest is subject to all applicable federal, state and local laws.
6. All entries should be mailed to Contest Headquarters, Washington Steel Corporation, Washington, Pennsylvania.

WASHINGTON STEEL CORPORATION
WASHINGTON, PENNSYLVANIA

INDEPENDENT Baseboard Registers *with Bendable Fins*



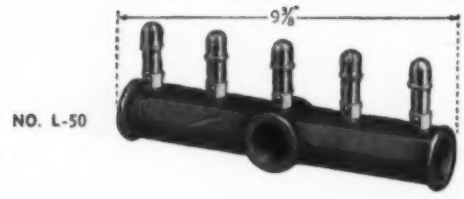
No. 92 Two-piece, with removable grille

★ The simple artistic lines of this register express streamline design at its best and harmonize with the furnishings of the modern home. Fins are regularly set to deflect air flow slightly upward; but being easily bendable, they can be adjusted to direct air flow straight outward or downward, as required. Scientific design affords large open area with minimum air resistance.

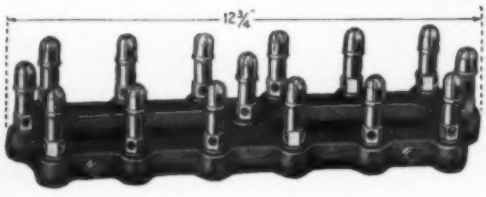
Send for Catalog 48

Always Leading—Always Progressing

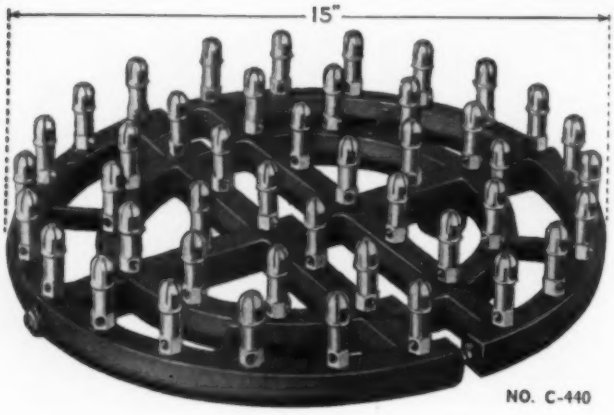
THE INDEPENDENT REGISTER CO.
3747 E. 93rd STREET · CLEVELAND, OHIO



NO. L-50



NO. SC-151



NO. C-440

Some New Designs in

BARBER Appliance BURNERS

These new Barber models are useful for the needs of many appliance makers. The slotted cap burner No. L-50 will be found very adaptable in any long, narrow combustion chamber, and when heat must be uniformly distributed over a wide surface, and "spot heating" must be avoided. The units composing the assembly can be mounted end-to-end to make a very long row of single jets, or side by side to make a bank of burners. The manifold and intake are adequate to supply gas to a large size multiple assembly. If you have a problem of this nature, let our engineers submit a layout sketch showing the possibilities of this unit.

The slotted cap jet burner No. C-440 is designed for applications requiring a large size burner. It is made up in two sections for ease of installation in entrance doors too small for one circular burner of the same diameter.

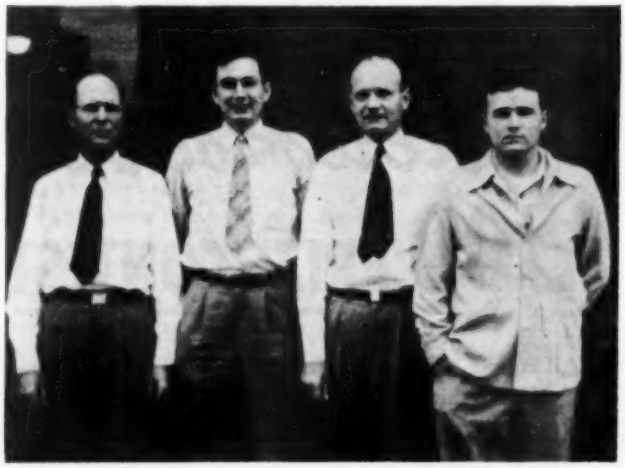
Barber Gas Appliance Burners, and Barber Conversion Burners, in numerous shapes and sizes, are specifically designed for the individual requirements of all gas appliances, with jets to suit the purpose and the type of fuel—natural, manufactured, or LP gas. Any Barber-equipped appliance has THE most essential element for satisfactory operation—the proper burner unit.

Ask for complete new Catalog on Barber appliance and conversion burners, and pressure regulators.

THE BARBER GAS BURNER CO.
3704 Superior Ave., Cleveland 14, Ohio

BARBER *Automatic* JET GAS BURNERS

DES MOINES STOVE REPAIR CO. 107 S. W. Second Avenue, Des Moines, Iowa, has announced a change in corporate name to Des Moines Furnace & Stove Repair Co. The purpose of the name change is to bring the corporate name more in line with the business actually done by the corporation, and promotional material will refer to "Des Moines Furnace."



R. S. DeHoedt J. M. Green F. R. Green F. L. Green

Des Moines Furnace held a school for dealers on Friday, April 22, 1949 at the new Armstrong Furnace Co. plant in Des Moines. Approximately 125 dealers from all over Iowa were in attendance. The school lasted for only one day so that dealers would not be kept away too long from their spring business.

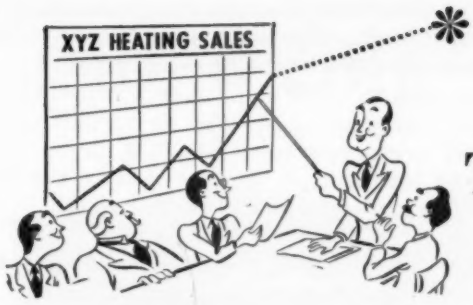
Topics covered in the morning talks included engineering and performance data on coal, gas, and oil furnaces. At noon a buffet luncheon was served. The afternoon talks covered credits, sales, and sales promotion. The final talk was a speech concerned with the sales outlook for 1949. Speakers on the day's program were officers and engineers from Des Moines Furnace and from Armstrong Furnace Co. R. S. DeHoedt, sales manager of Des Moines Furnace was master of ceremonies for the program.

General comments received on the school were satisfactory and many expressed the belief that it should become an annual affair.

IN ORDER TO ELIMINATE some of the confusion existing in the industry regarding the name Aircor, the Air Filter Corp., Milwaukee, Wisconsin, has announced that its line of air grease and welder filters will be sold under the trade name of Airsan. No other changes are involved and production is gradually increasing in newly expanded facilities, according to Roger W. Clark, president.

FRANK MEYER, founder of F. Meyer & Bros. and the Meyer Furnace Co. of Peoria, Illinois, was the subject of one of the ads in a series run by a local bank, called "Builders of Peoria." The purpose of the series being run by this financial institution is to dramatize the virtues of thrift and saving, and to point out that the city of Peoria owed much to the men titled "Builders of Peoria" in its early beginnings.

Some biographical data is given about Mr. Meyer as follows: "Frank Meyer, founder of F. Meyer & Bros. and the Meyer Furnace Co., was born in Germany in



Brundage MAKES THE DIFFERENCE...*Again!*

This time with their new, improved blower filter unit! Its new design allows more efficient use of filter area... Fewer parts for more simplified installation . . . Still more compact to meet need for conserving utility space.

The same craftsmanship and engineering skill which has made the name Brundage synonymous with quality for 30 years is maintained in this latest product designed to meet increasing demands by homeowners for greater indoor living comfort.

For service, for quiet operation, for complete customer satisfaction, Brundage sturdy, all-steel cabinet unit is the best you can buy. Write for information.

Furnace Blower Twin Assemblies . . . Exhausters . . . Air-Renewers

Brundage COMPANY

Blower Specialists Since 1919

610 NORTH PARK STREET
KALAMAZOO 11, MICHIGAN

THE "pint size" NORMAN SOUTHERNER

Horizontally Designed Forced Air Gas Furnace

Fits More "Specs" For Dealers, Contractors, Builders

Get acquainted with the compact, horizontal design and proven performance of this revolutionary forced-air central heating system. It has 101 practical applications to help you solve today's heating and sales problems.

The Southerner fits in the attic, closet, under the floor, ceiling or stairs, on service porches or any other small space. Meets all safety requirements of AGA for this type installation. Recommended for all types of homes and commercial buildings.

Thousands of installations —including the first Revere Quality House—have proven the new heating convenience and comfort of this improved method of central heating.

Available in 30,000, 60,000, 80,000 and 100,000 BTU in both Furnace and Unit Heater Models Burns natural, mixed, manufactured or LP gas

Model illustrated: FUB-100, size 21¼" high by 23" wide by 52" long.

For low cost conversion to automatic heat, get the facts on Norman Gas and Norman Gas-Oil Conversion Burners.

MAIL THIS COUPON TODAY!

NORMAN PRODUCTS CO., Dept. 23
1148 Chesapeake Ave., Columbus 12, Ohio

Please send complete details and information on the Norman Southerner and its 101 applications to the new construction and replacement heating market.

Name .....

Company .....

Address .....

City .....

1844 and came to Peoria in 1852, via sailing vessel to New Orleans, thence by river to Peoria. As a tinsmith's apprentice he managed to save $200 and with this capital established a little tin manufacturing business, from which has grown the impressive businesses bearing his name."

PLANS FOR THE 1949 SEASON were recently presented at the annual sales clinic of the Nu-Way corporation,

First row—L. to R.: O. K. Gipple, Vice-President and Treasurer of Nu-Way; President Wm. F. Klockau, J. E. Rettke, L. E. Arnold, H. E. Doyle. Second row L. to R.: W. W. Stuart, A. L. Addis, J. W. Hamilton, M. A. Davies, D. Blough, J. J. McCarthy, R. F. Ashton. Third row L. to R.: R. G. Neville, I. Gibbons, L. E. Wood, A. E. Olson, P. J. Ayton.

Rock Island, Illinois. Mr. O. K. Gipple, sales manager, conducted the meeting. Company representatives from all over the United States were in attendance.

Features of the meeting included the presentation of Nu-Way's sales and advertising plans for the spring and fall seasons of 1949 to the representatives.

A special feature of the clinic was a concentrated course in the servicing of Nu-Way oil burners which was attended by representatives. Mr. H. E. Doyle, plant manager and Mr. Louis E. Arnold, head of the new engineering department, conducted the course.

J. W. PROIE has opened a wholesale warm air heating, air conditioning and roofing supply business at 610 West Washington Avenue, Pittsburgh 26, Pennsylvania. Mr. Proie for 14 years was sales manager of Proie Bros. Co., and prior to that was a sales engineer with Manufacturers Light & Heat company of Pittsburgh. New warehouse facilities for lines carried have been constructed at the above address.

THE NORTHWEST FOUNDRY and Furnace Co. of Portland, Oregon, has taken over the entire sales distribution of its line of heating equipment, according to an announcement made by W. R. Pindell, vice president and general manager of the company.

This company is a pioneer in the manufacture of metal products in Portland and since 1922 has produced its own line of heating equipment under the trade name of Wesco. Mr. Pindell also announced the introduction this spring of a new line of oil burning furnaces for homes in the low price brackets.

The firm has occupied a 2 acre plant at 2345 S.E. Gladstone for many years and distributes its products throughout Oregon, Washington, Idaho, Montana and Northern California.

TRIANGLE

SHOCK-ABSORBING

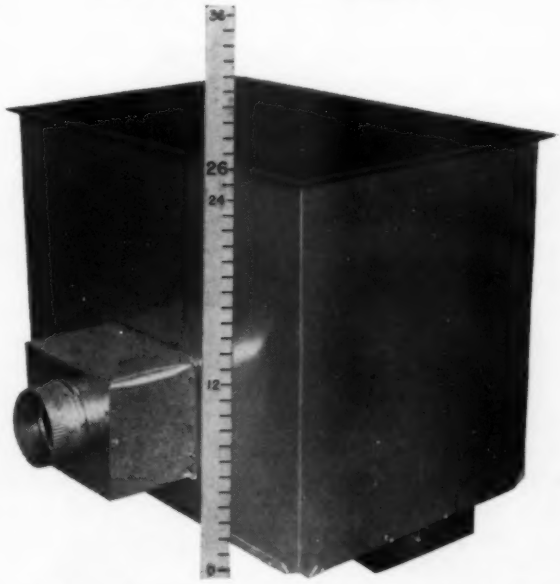
PILLOW BLOCK

Designed for fans, blowers and other devices requiring silent operation, perfect alignment, self lubrication and minimum obstruction to air flow. Shown here is one of Triangle's new improved, steel-stamped Pillow Blocks. Special mountings designed to meet every specific need . . . inquiries invited.

WRITE DEPT. A FOR DETAILS

TRIANGLE MANUFACTURING COMPANY • OSHKOSH, WISCONSIN

JOHN ZINK



"SHORTY" FLOOR FURNACE
ONLY 26" DEEP

— Two Sizes Available —

30,000 Btu ——— 50,000 Btu

AGA Approved for Natural, Manufactured and Liquefied Petroleum Gases

These new floor furnaces are especially designed for installation where underfloor space is limited. Being only 26" deep, they can be installed where foundations are extremely low, eliminating the necessity of making a pit.

CONVERSION BURNERS

TWO MODELS AVAILABLE

Luminous Flame Model Illustrated

LUMINOUS FLAME MODEL

Easy to install. Operates manually or automatically. Burns clean fuel—natural, mixed, manufactured or LP gases — without soot or smoke. Luminous flame radiates heat two to three times faster than a blue flame. Four sizes available for either vertical or horizontal firing.

BLUE FLAME MODEL

Designed to meet the requirements of this type of burner. Capacity range of 100,000 to 200,000 Btu/hr. for operation on natural, mixed or manufactured gases. Manual or automatic operation. Easy to install

Write for Literature

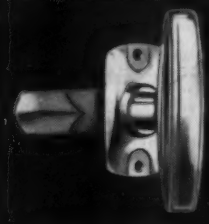
John Zink Company

4401 SOUTH PEORIA

TULSA, OKLAHOMA

New York — Salt Lake City — Houston — Los Angeles

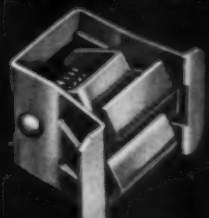
make *National Lock* your *"1-Source"* hardware supplier



61-366 HANDLE

61-270 CATCH

RECESSED HEAD SHEET METAL SCREW



61-340 CATCH

STOVE BOLT

and take advantage of...

- simplified purchasing
- complete selection
- simplified control
- lower shipping costs
- uniform high quality
- prompt delivery

all these dependable National Lock items are ideal for use on:

- space heating units
- air conditioning equipment
- oil burners
- stokers
- gas heating units
- humidifiers

write us for full information

NATIONAL LOCK COMPANY

Rockford • Illinois

PERFEX CORP. of Milwaukee, Wisconsin, manufacturer of automatic temperature controls has announced some recent personnel changes. Douglas L. DeVos has

D. L. DeVos B. F. Werb E. W. Wiese

been made Chicago regional manager for the Controls Division. Mr. DeVos joined Perfex in 1946 and has been active in the service and educational departments of the company and for the last year has been a sales engineer with the sales department in the Cleveland and Detroit offices.

B. F. Werb has been promoted to West Coast regional manager of the company. His new offices will be in San Francisco, California. Mr. Werb is a veteran of 24 years in the heating field and has been with Perfex since 1940. His most recent position was manager of service distributor sales. In his new post he will handle contact of original equipment manufacturers, as well as supervising service distributors in the west coast region.

E. W. Wiese has taken over the franchising of service distributors for the controls division. This was previously handled by Mr. Werb. Mr. Wiese has been identified with the heating industry for many years having previously been associated with the National Radiator Corp., Crane Co., and Barber-Coleman Co. He has been with Perfex since 1945.

A SERIES OF SUCCESSFUL MEETINGS sponsored by the distributor organization of Boston Machine Works Co. of Lynn, Mass., has been held throughout the east and middle west during March and April. Speaking at the meetings for the Oil Heating Supplies division of Boston Machine, I. M. Nelson of the company's sales engineering staff, expressed the vital part that efficient installation must play in the present and future acceptance of oil as an economical fuel for domestic heat.

Mr. Nelson used as his subject "We must have more efficiency in our oil heating installations—How to do it —And the part Bosmaco Line plays in this program." His talk was supported by full diagrams of different heating systems and brought to the attention of his listeners the critical points in an over-all installation which must be checked for full efficiency by the installer, not only to maintain the reputation of his burner but also, and this is most important, to keep the fuel costs low.

At the meetings already held Mr. Nelson has pointed out to well over one thousand dealers, salesmen, heating engineers, and service men, that the installation of any burner calls for a knowledge of the over-all requirements of the entire heating system, careful checking of the heating unit, and the use of highly efficient accessories to maintain the desired capacity, coupled with fuel economy.

Certified Counterflow Oil Burning Winter Air Conditioner. May be sold with or without burner and controls for completely automatic operation.

Certified

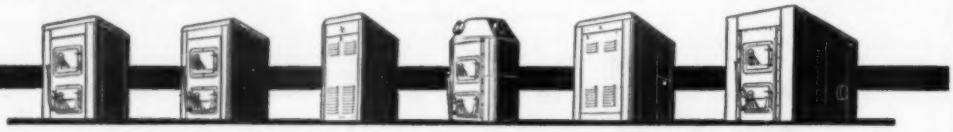
"ZERO PROVED" reliability SELLS your customers

They will welcome a heating unit able to beat Northwest winters. The Certified Counterflow is easy to sell, easy to install, easy to convert for any fuel. Our gas conversion and oil burners fit all Certified Furnaces.

Certified Counterflow size range includes the right unit for every home. Eight units for coal, oil and gas firing available in bonnet outputs of 90,000 to 325,000 B.T.U.

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

Certified HEATING EQUIPMENT



CERTIFIED FURNACE CO.

DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY

1000 BERRY AVE. ST. PAUL 4, MINN.

QUICK PROFITS . . . EASY INSTALLATIONS . . . SATISFIED CUSTOMERS

when you go after

REPLACEMENTS and CONVERSIONS

with

BANKHEAT BURNERS

Now is the time to replace oil wasting burners with a Bankheat. It's the easiest selling that you can do today . . . selling that will make you a profit, and a new set of satisfied customers.

Bankheat Burners have an unequalled reputation for oil-saving efficiency. In thousands of homes they are powering boilers, boiler burner units and water heaters. For many years in many lands they have been building up a record of economical performance. They're fully automatic, precision built, easy to install, exceptionally dependable. They are today's best bet for dealers who want sales. May we send you the full story?

There's an automatic Johnson Burner for EVERY heating need.

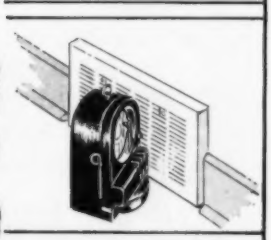
Johnson Oil Burners

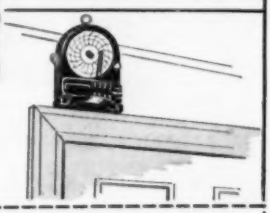
Builders of fine Oil Burner Equipment since 1903

S. T. JOHNSON CO.
940 Arlington Ave., Oakland 8, Calif.
401 No. Broad St., Philadelphia 8, Pa.

PORTABLE TEMPERATURE RECORDER . . .

Indispensable for SALES, INSTALLATION and SERVICE





"Very useful for selling installation jobs."

"Very satisfactory for recording outdoor temperature for 'degree day' operations."

"Makes it easy to check proper thermostat location."

"Used all the time for balancing heating systems."

"Has been invaluable as proof in settling heating complaints."

"Gives me proof of a good installation."

"Helped me discover incorrect 'night set-back' of clock thermostat in seconds instead of hours."

The **TEMPSCRIBE** Temperature Recorder gives continuous time-temperature records of room temperature or of air temperature at any specific point, such as at the thermostat, at floor and ceiling levels, and above the radiators or in front of warm air registers. The temperature graph, as recorded on a 4" chart, shows at a glance the highest and lowest temperature during the test period, duration of any temperature extreme, and frequency and spread of temperature fluctuations. The instrument is compact, self-contained; no electrical connection; requires no watching. Can be stood anywhere or hung on wall. Available in ranges to cover —30° F. to +160° F. temperatures. Choice of spring wound chart drives: 8 hour, 24 hour, or 7 day rotation.

BACHARACH INDUSTRIAL INSTRUMENT CO.
7000 Bennett Street · Pittsburgh 8, Pa.

Ask your jobber about TEMPSCRIBE Recorders, or mail coupon for Bulletin 720

Bacharach Industrial Instrument Co., 7000 Bennett St., Pittsburgh 8, Pa.

Send Bulletin 720 on TEMPSCRIBE Recorders to:

Name_____

Company_____

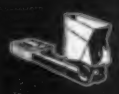
Street_____

City and State_____

We are: ☐ DEALER ☐ JOBBER ☐ MANUFACTURER

Follow up this

BIG LINE


Commercial Stokers

to greater heating profits

Domestic Stokers

STOKOL

Oil Furnaces

- A Heating Line you will be proud to sell.
- A complete Heating Line of types and sizes.
- A Line of Commercial and Domestic Stokers.
- A moderately-priced Heating Line.
- A fine quality Heating Line.
- A big name Heating Line made famous by years of national advertising.
- A Heating Line that will enable you to successfully compete on price, quality, reputation and provide a wide variety of home and commercial installations.

Coal Furnaces

Water Heaters

Gas Furnaces

Boilers

Oil Burners

CLIP AND MAIL THIS COUPON
WHILE GOOD TERRITORY IS STILL AVAILABLE

STOKOL-STOKER CO., INC.
DAYTON 1, OHIO

Please send me complete information on the BIG STOKOL LINE.

Name_____

Address_____

City_____ Zone____ State_____

THE APPOINTMENT OF M. L. LAVORGNA, INC. as distributor for Janitrol domestic-commercial heating equipment in the Wisconsin territory was announced by C. B. Phillips, Vice President, Surface Combustion corporation. The organization is headed by Mr. Lavorgna, a veteran of 17 years experience in the heating and air conditioning industry.

A member of the American Society of Heating and Ventilating Engineers, Mr. Lavorgna is also a registered professional engineer in the state of Wisconsin. Prior to his appointment as a Janitrol distributor, Mr. Lavorgna was manager of the Heating Division of Richmond radiator company.

M. L. Lavorgna, Inc. will maintain headquarters in Milwaukee and plans to establish branch offices in Green Bay, Marshfield and Madison, Wisconsin, with a complete sales, engineering and service staff. In addition to the complete line of Janitrol heating equipment, the company will carry related but non-competitive lines produced by other manufacturers. Operational plans include the conducting of sales, engineering and service meetings and schools to provide a maximum of service to heating contractors, builders, architects and consumers in the Wisconsin area.

M. L. Lavorgna

J. G. Wilsey

WILSON & COMPANY has announced the promotion of John G. Wilsey to the post of manager of Hair Filter Sales. This is a department of the Wilson Hair Products Division, headed by Charles W. Becker.

Mr. Wilsey joined the Hair Filter staff on November 1, 1948, coming from the Winchester Repeating Arms company electrical division where he served as sales supervisor. Mr. Wilsey has been associated with the heating and ventilating industry for many years, beginning with furnace installations in 1932. Later he worked as a jobber and dealer salesman and eventually managed a heating and ventilating business of his own. All of this experience has given him a broad background in this specialized field.

THE L. J. KRAUSE CO., 200 Lumber Exchange, Minneapolis, Minnesota, has been appointed to represent Penn Electric Switch Co., Goshen, Ind., in the Minneapolis district according to R. H. Luscombe, Penn's general sales manager. The territory covered will include Minnesota, North and South Dakota and western Wisconsin.

Lin J. Krause, owner and operator of the newly-formed Krause Company, is well known in heating, refrigeration, and allied fields. Mr. Krause is an associate member, past secretary, and entertainment committee chairman of the Minnesota section of ASHVE.

NOW AVAILABLE

A complete reprint, under one cover, of Professor S. Konzo's invaluable series of articles —

The

"HOW, WHAT AND WHY"

of the New

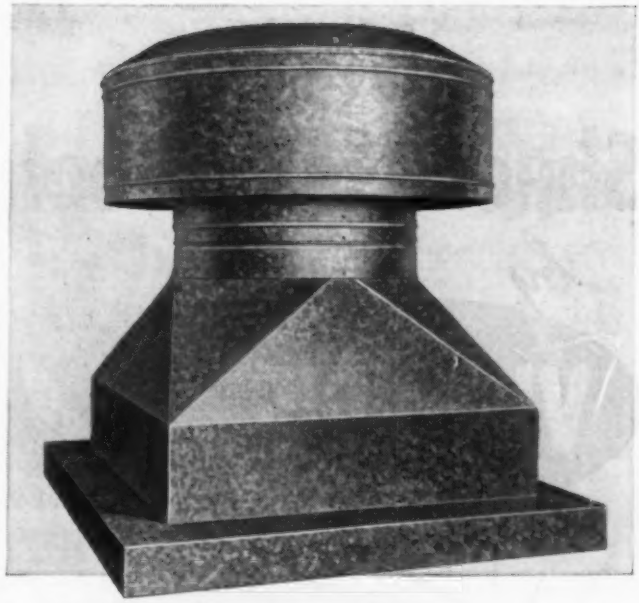
Winter Air Conditioning Manual

Everyone who is now using or expects to use the new "Code and Manual for the Design and Installation of Warm Air Winter Air Conditioning Systems" will find Professor Konzo's series a source of much practical help in understanding the Code and correctly applying it to actual jobs. In this great series, Professor Konzo not only explains step by step exactly how to use the Code, but, in addition, tells in detail of the research and experience that is behind each step in the suggested procedures.

Price — Only $1.00 per copy

AMERICAN ARTISAN

6 NORTH MICHIGAN AVE. CHICAGO 2, ILLINOIS



Sell These New

Profit Makers–

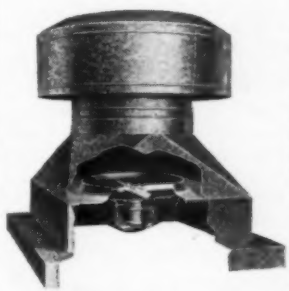
Swartwout

VALVENT

ROOF VENTILATOR

Gravity Model • Powered Model

Moderate priced ventilator for hundreds of industrial and commercial needs. You can "go to town" with these new ventilators . . . Swartwout's latest addition to their line of high quality equipment. A popular type for many installations, these models (gravity and powered) are made in 5 throat diameters – 12, 18, 24, 30 and 36 inches. Sturdy galvanized steel construction; pleasing appearance; efficient air-flow design; unique double cone damper and air stream guide. Powered models have unusually effective propeller fan unit.



Capacities 630 cfm to 25,700 cfm. Simple damper chain lock permits any opening from full open to completely closed. Bases available to fit any type of roof. Learn about Swartwout's new VALVENT Roof Ventilators at once . . . and start reaping extra profits.

Write for data sheet.

THE SWARTWOUT CO.
18615 Euclid Ave., Cleveland 12, O.

Swartwout *Controlled* **Air Circulation**

EQUIPMENT FOR EFFECTIVE ECONOMICAL VENTILATION OF INDUSTRIAL BUILDINGS

New Sheet Metal Tool

by VISE-GRIP

Everywhere, sheet metal men are saying the new VISE-GRIP Sheet Metal Tool is just what they want! It has many advantages:

- **LOCKS to work with powerful non-slip grip**
- **Therefore, does more perfect forming**
- **Eliminates tiresome hand-gripping**
- **Adjustable to non-locking action**
- **Has extra deep throat**

Double-lever action not only exerts tremendous jaw pressure but LOCKS jaws to the work. Even when adjusted for non-locking action, a light hand-grasp exerts tremendous pressure on the jaws. Nickel plated. 8" long.

WIDELY ADAPTABLE

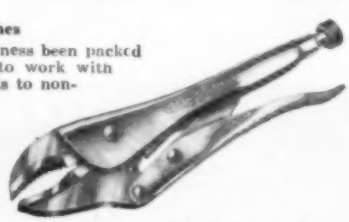
Most useful hand tool ever developed for bending, forming, seaming, crimping or straightening sheet metal. For holding templates, holding sheet metal for welding, working inside stacks, bending lead, etc.

Order VISE-GRIP Sheet Metal Tools from your supplier. If he doesn't have them yet, order direct. **Only $2.95 each.** Guaranteed.

VISE-GRIP Wrenches

Never before has so much usefulness been packed into a single hand tool! Locks to work with Ton-Grip. Easily released. Adjusts to non-locking action.

No. 7W, 7" with cutter, $2.25
No. 10W, 10" " " 2.50
No. 7C, 7" without cutter, 1.85
No. 10C, 10" " " 2.25



PETERSEN MFG. CO. Dept. AA-6, DeWitt, Nebr.

APPOINTMENT OF E. W. SMITH as special assistant to the general sales manager of Owens-Corning Fiberglas corporation has been announced by Ben S. Wright, general sales manager.

Until recently Mr. Smith was vice president for sales of Philip Carey Manufacturing company. He is president of the Asbestos-Cement Products Association, a committeeman of the Producers Council, and a director of the National Mineral Wool Association.

Mr. Smith will work with Owens-Corning's branch offices and sales divisions on the distribution of Fiberglas products into industrial building and related fields.

E. W. Smith

Paul Watts

THE APPOINTMENT OF PAUL WATTS as general sales manager of Skilsaw, Inc., Chicago manufacturer of portable electric and pneumatic tools, has just been announced by Bolton Sullivan, president.

Mr. Watts, a veteran of 25 years in the electric tool field, has been with Skilsaw, Inc. for nine years and has been Pacific Coast manager since 1947. He will shortly move his headquarters to the company's recently enlarged plant and main offices in Chicago after 22 years in the San Francisco territory.

A NEW JOBBER'S PRICE LIST, just issued by the M. A. Gerett corporation, Milwaukee 5, Wisconsin, reinstates 1939 prices on E-Z-Ons, the damper regulators that punch their own holes, rivet themselves at a hammer's blow, and offer no air flow resistance.

The new prices nullify the temporary increase of July, 1948 and reduce the cost of E-Z-On damper regulators to the price levels established when they were first put on the market.

RESEARCH PRODUCTS CORP., Madison, Wisconsin, has announced that R-P Alumaloy Air Filters have been approved by Underwriters Laboratories. This listing includes Class 1 on dry filters and Class 2 on adhesive treated filters, making available "listed" air filters for a wide variety of uses in heating, ventilating, air conditioning, and air cleaning applications.

QUIET AUTOMATIC BURNER CORP. has announced the opening of a new building housing its retail heating department. This new office is located near downtown Newark and has about seven different types of furnaces on display. The factory of the corporation is located in Montclair, about six miles away.

The Product of Over 15 Years Experience In the Design and Construction of Air Moving Equipment

KLEENMASTER

KLEENMASTER PROFIT-PACKAGE INCLUDES:

- 1949 Ford or Chevrolet truck at list, no extras
- Power unit assembly; LeRoi engine with electric starter and hand throttle, welded steel exhauster
- Two-season sateen filter bag, 32' by 6' diameter
- 100' flexible reinforced rubber hose and steel tubing, 20 new type couplings

ONLY KLEENMASTER OFFERS ALL THESE ADVANTAGES:

- Twin disc clutch prevents overload of engine during starting
- Heavier gauge 3/16" welded steel construction gives more years of service
- Units available for mounting on either side of truck to conform with state laws
- Patented rubber slip-on tube couplings
- 3-color literature for selling the home owner
- Full guarantee for one year
- Time payment plan

Also available in trailer mounted junior model, or without truck or trailer

BIG NEW PROFIT-PACKAGE

"CLEANS UP" TWO WAYS!

1. Bigger Profits! — KLEENMASTER Saves Man Hours, Time, Expense. Because it's the world's largest vacuum cleaner, with much higher velocity suction, Kleenmaster cleans better, faster. Cleans heating plant in less than 1 hour, smaller cleaners take 2 or 3 hours. You make at least $15 on each job, do an average of 8 thorough cleaning jobs per day.

2. KLEENMASTER Opens Door To Equipment, Repair Sales. Because you clean so many more heating plants with Kleenmaster you're in contact with far more home and building owners, get more orders for repairs, new equipment, and complete heating systems. Steps up profits.

Home Owners Definitely Prefer KLEENMASTER. Because Kleenmaster's tremendously powerful suction penetrates where smaller cleaners can't, does the job so much more thoroughly, and faster. Also, with Kleenmaster there's no messy tracking of portable cleaners from room to room, Kleenmaster draws all the dirt outside, into its enormous bag.

SEND TODAY!
Get details and FREE literature!

molloy sales corp. 3445 N. WESTERN AVENUE • CHICAGO 18, ILLINOIS
3617 HAVERFORD AVENUE • PHILADELPHIA 4, PENN.

You'll Sell Your Customers More When You *Sell Them Clipper*

Here is a typical Clipper air-conditioning furnace with front panels removed to show easy accessibility of controls, blower and burner equipment.

Not only do Clipper automatic gas-fired furnaces with the Multi-Stream Heat Exchanger offer efficient economical heating, but also modern air conditioning for the greatest living comfort.

COMPLETE RANGE OF SIZES. Clipper furnaces are built in a range of sizes from 80,000 to 200,000 BTU.

COMPETITIVE PRICES. Despite their fine engineering, heavy gauge metals, highly improved controls and other features, Clipper gas-fired furnaces are priced in competition with ordinary furnaces.

IMMEDIATE SHIPMENT. Due to the size of the Henderson plant, equipped with the most modern machinery and to the fact that the plant is located in one of California's most productive climates where steady home-owning mechanics are available, we are able to give you immediate shipment of any model.

Compact, with baked enamel finish, the Clipper is attractive for installation anywhere. Clipper units are easily installed even in a small closet. *All Clipper furnaces, regardless of size, are shipped to you completely assembled, completely wired and individually tested at the factory.*

You'll Find the Clipper Enables You to Sell More—For complete information on Clipper gas-fired units and also on the details of a profitable sales representation plan, fill out and mail this coupon.

HENDERSON FURNACE AND MFG. CO.
SEBASTOPOL, CALIFORNIA

Henderson Furnace and Manufacturing Co.
Sebastopol, California

I am interested in the sales opportunities of Clipper furnaces. Please send me complete information.

*Name*_____

*Address*_____

*City*_____ *State*_____

BOTTOM PRICE
for LUXURY HEAT...
Sells This NEW UNIT
to America's Biggest Market

Delivered COMPLETELY PACKAGED

Sell *luxury* heat at a price within reach of America's biggest market . . . families building and renovating homes priced under $10,000 . . . but *don't* cut *your* fair profit. *Penn* has done the profit cutting at the factory . . . paring its own margin because it anticipates big volume on its new *Packaged* Air Conditioner Furnace.

However . . . timely though it is . . . price is far from the whole story on this new unit. Here are just 3 of the other big features:

1. Delivered *completely assembled in the jacket*—with all wiring done at factory.
2. Stainless steel construction gives smart, modern appearance . . . extra long life.
3. Compact size—length 49" x height 50" x width 21½"—permits two men to carry it through an ordinary doorway.

RIGHT NOW is the time to offer a price conscious market this "little giant" among heating units. Production is limited—so don't delay writing for franchise and engineering information.

PENN BOILER AND BURNER
MANUFACTURING CORP.
LANCASTER, PA.

D. D. PIPER, executive vice president and director of sales for Norman Products company, Columbus, Ohio, announces several new additions to the sales staff in an expanded program.

Henry J. Mandel has been appointed eastern division manager with headquarters in New York; George P. Mandel will be midwestern division manager covering Ohio, Indiana, and Illinois; and Russel G. Dawley is the new sales engineer for Norman.

G. P. Mandel H. J. Mandel R. G. Dawley

Henry Mandel, who has had a wide and varied experience in the gas industry, comes to Norman from Richmond Radiator company where he was sales engineer for their New York office. He had previously been with Surface Combustion Corporation, and Combustion Utility coporation where he assisted in the design of their original gas heating equipment.

George P. Mandel is also a veteran in the gas industry. Prior to joining Norman he was district manager for Surface Combustion corporation for 25 years with headquarters in Columbus. Before joining the sales force of Surface Combustion in 1927 he worked for the Combustion Utility corporation in their engineering department on the development of space heating equipment.

Russel G. Dawley has been with the Russel R. Gannon company as sales manager of the Columbus territory.

LOUIS B. ROGERS has been employed by the Atlanta sales district of Perfection Stove company to travel the Louisiana and Southern Mississippi territories.

A graduate of Louisiana State University with a B.S. degree in vocational education, Mr. Rogers was a vocational teacher in Doyle, La., for five years before entering the service in 1944.

In 1946, Mr. Rogers left the educational field for sales work, affiliating himself with the hardware and machinery division of the Sunbeam Corporation. After two years with this organization, he became chief of the training division of the Louisiana State Civil Service Department, a post he held until his employment by Perfection.

AMERICAN NICKELOID announces the recent appointment of George A. Spencer to head its Los Angeles sales office. As new west coast sales representative, Mr. Spencer will be located at 1323 Venice Blvd., Los Angeles 6, California.

Manufacturer of pre-plated metals celebrating its 50th anniversary last year, American Nickeloid Company is widely represented through 16 sales branches

WHITNEY METAL
TOOL COMPANY

39 YEARS EXPERIENCE

NEW!

WHITNEY-JENSEN
No. 131 SNAP LOCK PUNCH

Extremely useful for installers of ducts, furnaces, air conditioning. Forms ears that will lock firmly. Reduces use of screws, saves time, makes tight joints. Makes ears on the job.

Capacity 20 ga. mild steel
Overall Length 8½"
Weight 1 lb.

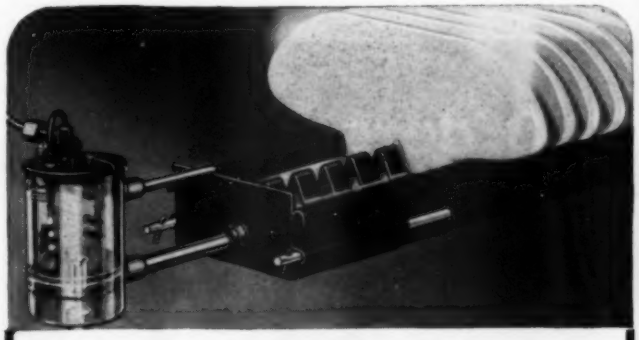
WHITNEY METAL TOOL COMPANY
91 FORBES STREET, ROCKFORD, ILLINOIS

PROFIT NOW!
WITH
GRAND RAPIDS FURNACE CLEANERS

It's easy to get a lion's share of furnace cleaning profits when you use a Grand Rapids Furnace Cleaner. Greater cleaning capacity, handling ease and practically designed groups of furnace cleaning attachments help you give better service and clean more furnaces per day at a higher profit.

Act now! Write today for complete information and prices.

DOYLE VACUUM CLEANER CO.
227 Stevens St., S.W. Grand Rapids 7, Michigan



There's Profit in Humidifier Sales

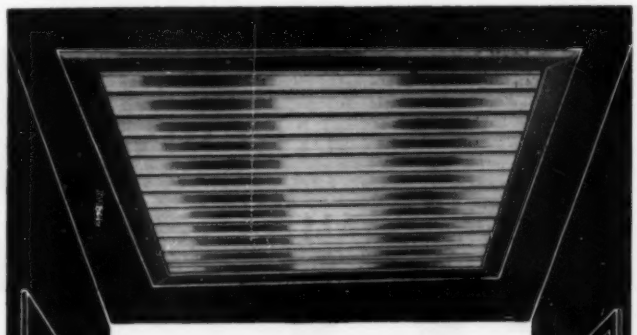
Growing sales figures prove that humidifiers are a profitable item for heating dealers. Home owners everywhere are realizing that proper humidity is a necessity—not only for health reasons (avoidance of head colds, etc.) but to save damage on dried-out furnishings. Also, with correct humidity content in the home, the "effective temperature" at which living quarters are comfortable is materially lower than it is without humidity conditioning—resulting in reduced fuel bills.

For permanent customer satisfaction, use Monmouth Flotrol or Micro-Feed models—easy to install, designed on unequalled engineering principles, dependable in operation, low in cost—profitable to sell!

Descriptive bulletin and prices on request.

THE CLEVELAND HUMIDIFIER CO
7802 Wade Park Ave. Cleveland 3, Ohio

MONMOUTH HUMIDIFIERS



AIR-FLO
AUTOMATIC
CEILING SHUTTER
FOR ATTIC FAN

Built so they can be installed practically flush with the ceiling, AIR-FLO Ceiling Shutters present a refined, finished appearance. Their natural aluminum color blends with any decoration, eliminating need for painting, and no grille or winter cover is required. Furnished in 5 different widths, single panel up to 73" long. No operating mechanism shows. Built-in fusible link. Meets fire underwriters requirements.

WRITE FOR NEW CATALOG 43-C

Illustrations and details of the complete AIR-FLO line.

AIR CONDITIONING PRODUCTS CO.
2340 W. LAFAYETTE BLVD. • DETROIT 16, MICH.

in this country and Canada. Home office and plant is located in Peru, Ill., with a considerable portion of the manufacturing carried on at the Walnutport, Pa., branch plant.

THE RECENT ANNUAL Spring Combustioneer Sales Meeting closed April 8. District manager and factory representatives had convened at the factory in Springfield to receive plans for 1949.

New merchandising plans for Combustioneer Stokers

were introduced by H. E. McCampbell, sales manager. Mr. McCampbell outlined plans for expansion of outlets during 1949.

Highlight of the program was introduction of new engineering improvements on the 1949 stoker line. A complete line of hopper and bin feed models from 15 to 1000 pounds per hour burning capacity have been developed. A. R. Massman, assistant sales manager, spoke on dealer activities in all territories covered by the district managers.

A new co-op advertising program was released by C. L. Brooks, sales promotion manager. Combustioneer does national trade paper advertising plus co-op dealer advertising at the consumer level. At various times during the meeting outside speakers entered the program to deliver talks on various subjects in the field of business, heating and stoker industry.

AMERICAN RADIATOR & STANDARD SANITARY CORP. of Pittsburgh, Pennsylvania has made some recent changes in managerial positions. M. V. Osterhout, manager of the Milwaukee branch has been appointed supervisor of the south central division, according to Robert W. Lang, vice president and general manager of branches. The south central division has been newly created; its headquarters will be in Cincinnati and the branches under Mr. Osterhout's jurisdiction will consist of those located in Columbus, Springfield, and Lima, Ohio; Parkersburg and Charleston, West Virginia; Louisville, Kentucky; Evansville, Indiana; St. Louis, Missouri; and East St. Louis, Illinois.

Francis P. McAneny, a member of the sales force has been made manager of the Milwaukee branch to replace Mr. Osterhout. Mr. McAneny has been associated with the Milwaukee activities of American Stand-

Be Ready For All Orders For
Warm Air Heating Installations

HANDY PIPE

Fittings Meet Every Need And
Reduce Your Labor Costs

Extended Plenum Fittings Also Offered

All Orders Filled Promptly

F. MEYER & BRO. CO. • Peoria, Ill.

MOUNTING FUEL COSTS ARE CREATING MORE AND MORE STOKER CUSTOMERS FOR ME. I HAVE FOUND ECON-O-COL STOKERS MEAN FASTER SALES . . . FEWER SERVICE CALLS!

ECON-O-COL COAL BURNER
THE SHIELD OF QUALITY

ECON-O-COL

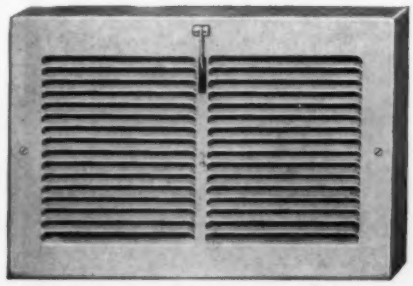
The "Stronghearted" Stoker

BUILT BY COTTA TRANSMISSION COMPANY • ROCKFORD, ILLINOIS

TWELVE SIZES . . . 30 TO 1250 LBS. PER HOUR

WRITE FOR DETAILS OF THIS COMPLETE LINE OF PRECISION-BUILT, HIGHEST-QUALITY STOKERS

SAVE $$$ By Using → A&A REGISTERS



For SMALL HOMES & BUILDING PROJECTS

Here's a single valve register with adjustable fins that combines quality and economy. See how you can save on air conditioning and gravity base registers. Ask your supplier or write.

THE A & A REGISTER CO.

8327 Clinton Rd. **Cleveland, Ohio**

Geo. G. Auer, Pres.

SUPER FACTS—

- *No special training needed.*
- *Reveals need for repairs and replacements.*
- *Does not disturb the household.*
- *Does not leave mess nor scattered dust.*

Make This a SUPER Summer

A Super Red Streak Furnace Cleaner will keep you busy all summer. It reveals worn out or damaged parts which can be repaired or replaced before another winter season begins. The Super is easy to operate and does a thorough job in any furnace. Chimney too, from the bottom up. Let us send you a Super to try for 5 days free. You keep what it makes.

National Super Service Company, Inc.

1944 N. 13th Street, Toledo 2, Ohio

The National Super Service Company of Canada

Toronto, Ont. **Vancouver, B. C.**

Beverly THROATLESS SHEAR

Cut any Shape . . . STRAIGHT OR IRREGULAR

Model B-3 with ball-bearing hold down

You can make straight or intricate cuts in the lightest metals without distortion, yet handle heavier gauges with ease on a Beverly—"the Shear that experience built and performance made." Smooth, powerful, clean-cutting action of the Beverly have made it the pre'erred shear wherever metal is cut. Ask your Dealer to show you these superior metal cutting tools . . . or write for more details and illustrated circular. Made in 4 sizes to handle 18 ga., 14 ga., 10 ga. and 3/16" mild steel. H.C.H.C. blades available for cutting stainless steel.

FLOOR STAND

Mounted on this welded, all steel stand, your Beverly is in the correct position for most efficient cutting . . . is accessible from all sides . . . makes work easy to see from any angle. Top of heavy gauge steel is drilled for mounting Shear. 30" high, the Stand can be furnished with blank top for mounting other machines or tools. Top is 7" x 11". Floor space 24" x 30".

Write for Circular

BEVERLY SHEAR MFG. CO.

3008 W. 111th Street
CHICAGO 43, ILL.

"SHEAR IT CLEVERLY WITH A BEVERLY!"

General Controls

A-100-5 THERMOPILOT RELAY

Provides automatic gas safety pilot control of the electrical circuit, operating solenoid valves and blower motors in heating units. Is manual reset, thermocouple type relay.

(a) Flexible type Thermocouple available in 12, 21, 30 and 48 inch lengths.

(b) 26 R (fixed type) Series Pilot Burner with flexible type Thermocouple used to insure exact position of Thermocouple in relation to pilot flame. (See Bulletin SDL 26 R-1 for complete data.)

(c) Compression fitting provided with Thermocouple for installing Thermocouple to 26 R (fixed type) Series Pilot Burner.

For complete specifications request Bulletin SDL 100 R-1

GENERAL CONTROLS

801 ALLEN AVENUE GLENDALE 1, CALIF.

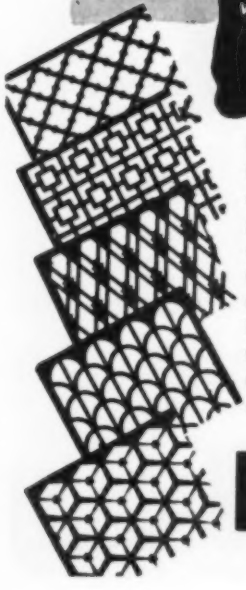
Manufacturers of Automatic Pressure, Temperature, Level & Flow Controls

FACTORY BRANCHES: Birmingam (3), Boston (16), Chicago (5), Cleveland (15), Dallas (2), Denver (10), Detroit (8), Glendale (1), Houston (6), Kansas City (2), New York (17), Oklahoma City (1), Philadelphia (40), Pittsburgh (22), Seattle (1), San Francisco (7), St. Louis (12) . . . DISTRIBUTORS IN PRINCIPAL CITIES

NEW JOBS OR REMODELING

GET MORE BEAUTY IN YOUR COMMERCIAL, RESIDENTIAL AND PUBLIC BUILDINGS *with* **H & K GRILLES**

WIDELY USED FOR
- Air Conditioning
- Heating & Ventilating
- Radiator Enclosures, Etc.



H & K Grilles—a recognized standard in the field for over 65 years—are the solution to any enduring architectural plan. Here are patterns both modern and classical to suit every taste and purpose. Besides beauty, there are functional considerations, too... matters of safety, ventilation, screens for hidden controls and equipment. When you specify "Grilles by H & K", you're sure of outstanding workmanship in a wide choice of designs and materials.

Write for literature

The Harrington & King Perforating Co

5649 Fillmore St., Chicago 44, Ill.
114 Liberty St., New York 6, N. Y.

ard and its predecessor companies since 1919 and is widely known in heating and plumbing circles here.

Darvin O. Rouzer, a member of the sales force of the American Standard branch in Altoona has been promoted to manager of the new branch at Parkersburg, West Virginia. Mr. Rouzer has been associated with American Standard since 1936.

FRANK V. CARROLL has been appointed consulting engineer of Inland Steel Company, it was announced recently. He will be in the company's Chicago offices, moving up from his position of chief engineer of the firm's Indiana Harbor Works.

One of the best known chief engineers in the steel industry, with a wide acquaintanceship among suppliers of steel mill equipment, Mr. Carroll joined Inland in November, 1921, as assistant chief engineer. He was promoted to the post of chief engineer of Inland's Indiana Harbor Works in March of 1927.

Fred H. Johnson, formerly assistant chief engineer of Carnegie-Illinois Steel Corporation, Pittsburgh, has been appointed by Inland as its chief engineer of the Indiana Harbor Works.

F. V. Carroll

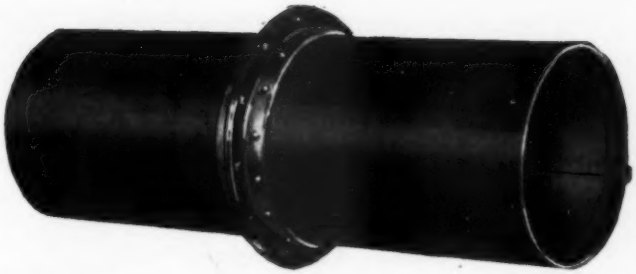
E. A. Weaver

AFTER SEVERAL YEARS as sales manager of the Janitrol Domestic-Commercial Heating Division of Surface Combustion corporation, Toledo, Ohio, Eugene A. Weaver is leaving to establish his own business. His company, to be known as the Weaver-Janitrol company, with offices in the Boulevard Building, 7310 Woodward Avenue, Detroit, Michigan, will distribute Surface Combustion and Webster heating equipment throughout the state of Michigan.

The Janitrol line of heating equipment is well known and accepted throughout Michigan, and many thousands of installations have been made by heating contractors and gas utilities since natural gas became available.

SURVEYS INDICATE that approximately 80 per cent of the estimated 800,000 new houses to be built in the United States in 1949 will have automatically controlled heating plants, Arnold Michelson of New York, vice president of Minneapolis-Honeywell Regulator company, said in an address before the eleventh annual convention of the Fuel Oil Distributors' Association of New Jersey in Asbury Park, N. J., April 29.

Mr. Michelson said best-informed authorities agreed that the oil heat industry was in a position to get about 60 per cent of the new business, if it took advantage of apparent sales opportunities. He spoke on



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Fit Tight!

You can increase the efficiency of every ventilating, exhaust, fume disposal and dust collecting system, reduce assembly time and make more profit with snug-fitting Rolled-Rite Steel Angle Rings. They are accurately rolled to a true circle and their perfectly flat surface assures a tight joint. Rolled-Rite Steel Angle Rings are available in 6" to 36" diameters—larger sizes rolled to your specifications. Also tees, channels, rods, bars and shapes rolled to any radius.

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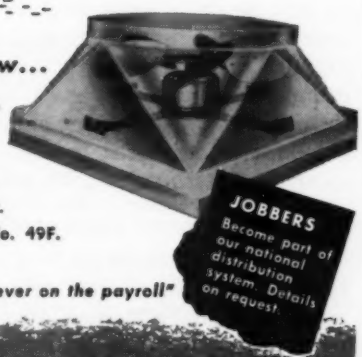
1 You've Always Known...

Western Rotary Turbine Ventilators—in all sizes from 6" through 48" throat. With *lifetime guaranteed* ball bearings. Both bearings on same axis *always* stay in alignment.

2 Now Meet the New...

Western Curb-Mounted Fan. Designed so fan diameter is the same as throat diameter. *This means more air for less money.* See why. Send for our new catalog No. 49F.



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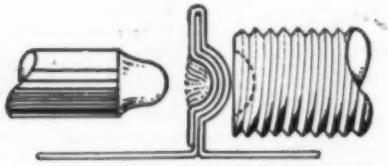
No. 6 Punch

This Tool is especially adapted for Button Punching or for Templet work. Punch will strip where handle cannot be opened to 90 degrees.



These punches are often called Tip Punches, and are used to fasten standing seams without making a hole, by simply indenting the three thicknesses of metal.

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Each Reznor heater gives air circulation in summer—automatic gas heat in winter. You can sell this 2 in 1 package in summer. Summer sales often mean extra sales . . . you avoid fall rush . . . you keep your men busy in off-season. More Reznors in use than any other. Catalog shows extra features . . . write today.

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"Controls—A Necessity of Automatic Oil Heat."

Good supplies of both fuel oil and burners are favorable factors for the oil heat industry in the keen competition for homebuilders' dollars, Mr. Michelson pointed out. Production of heating units should top 500,000 this year, compared with 400,000 in 1948, according to the Oil Heat Institute.

Controls Aid Acceptance

In tracing the growth of the industry, Mr. Michelson said that public acceptance of oil burners had been linked directly with the development of control equipment which made the heating plants completely automatic. These improvements have contributed to today's high standards of safety, reliability, comfort, economy and conveniences, he said.

Kruckman's Washington Letter—

(From page 71)

is the promise of our nation, the opportunity to start small and to grow to such size as the quality of our products and services, our brain and brawn, deserve. Some industries have to be big to be efficient. It is not bigness that is anti-social, it is monopoly. Competitive big businesses help to sustain the capitalistic system. It is the non-competitive big businesses, the monopolies, that have no place in a truly American economy.

Is Big Business Efficient?

"There is a general misconception of the relative efficiency of big business. Studies produced by the TNEC revealed that in most industries the middle-sized company was most efficient. The smaller independent units are usually efficient. In competition the clumsy monster corporation would be killed off in a free market. To survive, it must acquire the assets of its competitors, and then establish monopoly conditions, set prices, and do as it chooses in a non-competitive market. This excessive growth by acquisition of competitors should be outlawed.

"There is another factor that has so reversed the American pattern of equal opportunity that literally hundreds of thousands of smaller businesses are destined to stay small regardless of their product, their service, or their ingenuity. It is astounding that our own Government is the malefactor aiding monopoly in this instance. This stunting and paralyzing of promising small businesses is effected by the most inequitable tax provisions since the British used their tax powers to prevent the enterprising Colonists from interfering with the British monopolies.

Corporate Taxes Are Discriminatory

"Who can justify those corporate income taxes which tax every income dollar between $25,000 and $50,000 at 53 per cent, and then drop to 38 per cent for the benefit of the larger corporations? How many small businesses can hurdle a 55 per cent tax bite at this critical stage of their progress? The entire corporate tax structure is violently discriminating, sinister in its

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We specialize in rolling to your specific requirements angles, channels, tees, bars and special shapes.
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Coal - Gas - Oil
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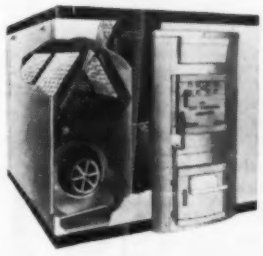
***BOBBY JONES** won the National Amateur Golf Championship 6 times, the National Open 4, and the British open 3 times.*



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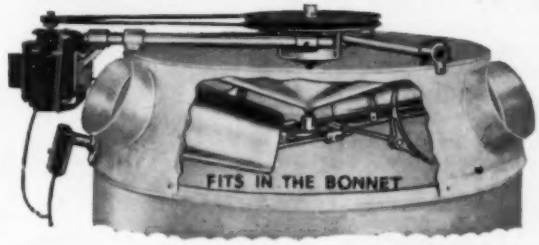
Now you can offer **EVEN HEAT DISTRIBUTION** and **MAXIMUM FUEL EFFICIENCY** with **CIRCULATAIRE** The New Improved Booster Fan for GRAVITY FURNACES

INSTALLED IN ABOUT TWO HOURS WITHOUT REMOVING BONNET



No baffles required — No new furnace pipes — No changes in existing ductwork — No wiring. CIRCULATAIRE not only overcomes cold rooms but also permits *Controlled Distribution of Heat* to each room as desired.

Thousands of homes with cold rooms—attic flats and other additions need this Low Priced booster fan.

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Mrs. W. H. S., Cicero, Illinois, recently converted the attic of her bungalow into an apartment and a heating problem developed; when the temperature downstairs was 76 degrees it was only 62 degrees upstairs. A "CIRCULATAIRE" was installed and now a balanced temperature of 72 degrees upstairs and down is easily maintained.

A COMPLETELY PACKAGED UNIT
Nothing for the dealer to furnish except limited amount of labor.

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BUILT to LAST and SERVE

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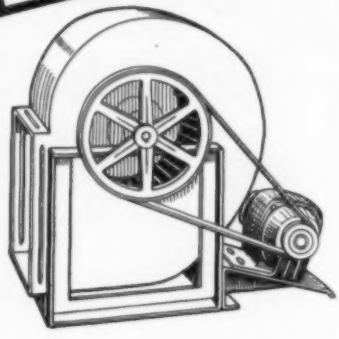
● There's a Hy-Duty properly sized for hundreds of jobs where large volume, low velocity and quiet are demanded—double inlet or single—top or bottom motor mounting—all discharge positions—200 c.f.m. to 15,000—heavily constructed—looks and finish to stack up with the best jobs and priced right.



Announcing . . .

A new, high powered, quiet, direct driven, single inlet Hy-Duty blower with a wheel 5" diameter, 3" wide. Immediate delivery, attractive price, suitable for a multitude of small air handling jobs.

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implications, against small businesses. Such ventures are so handicapped they cannot possibly attract investment capital for expansion or growth.

"Here are my suggestions for a specific plan to preserve our system, and the form of the Government which has made us the greatest nation in human history. 1. Exempt the first $25,000 of income. 2. Eliminate the discriminatory notch provision that taxes every income dollar between $25,000 and $50,0000 at 53 per cent. 3. Graduate tax rates starting at $25,000. 4. Allow taxpayers to charge off new plant and equipment more rapidly by realistic depreciation deductions. 5. Allow 2-year carry back and 5-year carry forward of losses. 6. Allow an option as to the deduction or capitalization of research and development expenses. 7. Take insurance carried by wife or children out of insured proprietor's wealth, even if the insured has provided funds to pay the premium. 8. Make possible for key employees to acquire stock at bargain prices without tax cost. 9. Allow more liberal deduction of capital losses. 10. Eliminate Section 102 of the Internal Revenue Act so that small companies can make reasonable provision for future bad years without unreasonable penalty.

"To reverse the increasing concentration of industry and commerce, a very definite and specific antitrust program is necessary. There must be effectively severe penalties for violation of the antitrust law. Any person found guilty of engaging in a conspiracy to control prices or to control supply, selling below cost to eliminate competitors, fraudulent or deceptive advertising, full-line forcing and tying contracts or exclusive leases, sales or contracts, discriminatory allowances, discounts or secret rebates, should be enjoined from serving as an officer or director of any corporation for a minimum number of years for the first conviction, and permanently enjoined from such service as penalty for second offense. There should be an amendment to the antitrust laws authorizing private suits for damages under the triple-damage provisions, allowing an injured party to collect three times the amount of the prohibited discrimination made against his purchases, plus interest, unless he can prove greater damage. Complete control of those mergers which are effected by the acquisition of the assets of competitors. Make it unlawful for any carrier in commerce to grant preferential commodity rates to any shipper or shippers. Prohibit consent decrees and nolo contendere pleas for antitrust violations. Amend the Robinson Patman Act to give cease-and-desist orders authority and conclusiveness. Amend the act to prohibit discriminations in rentals and royalties for commodities, including patented articles and copyrighted articles, leased or licensed in interstate commerce. Federal Trade Commission should be directed to study the system of multiple interlocking directorates and administration to determine limitations necessary to protect free competition. FTC should study the abuse of economic power to utilize costly infringement suits to prevent the development and use of inventions by small business. FTC should study the manner in which shippers may be compelled to divest themselves of all interest in any interstate carriers. FTC should study bank holding companies, their scope of ownership, operation, and control of non-banking enterprises. Oppose all

NEW STANDFORATED
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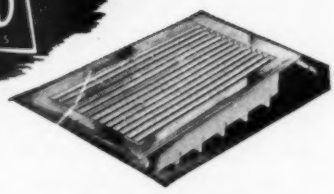

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newest -
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beveled edges
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more free air space
solid construction
no loose parts
ultra-strong baked on oak finish, longer wear, matches flooring. Made in all standard sizes

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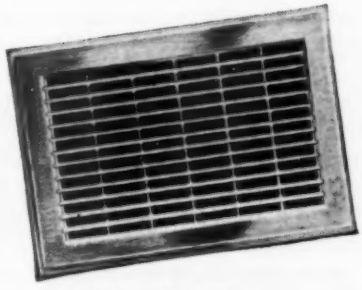

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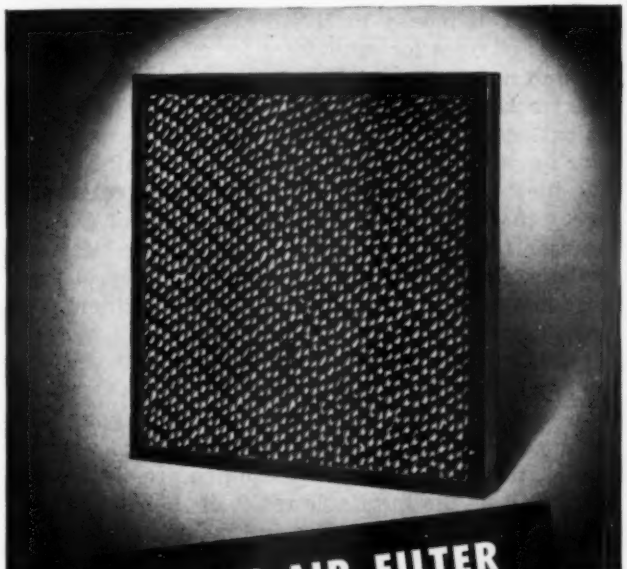

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YOU WILL PROFIT BY THESE EASY-TO-SELL, EASY-TO-INSTALL HOME FANS

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Popular spring mounted package unit for horizontal attic floor installation. Complete with all equipment and accessories for quick installation. 5 sizes 24" to 48". 4700 to 15000 CFM.

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Brand new spring mounted package unit for vertical attic installation. Easy to install with minimum building alteration. 9 models from 24" to 60" 5000 to 25000 CFM.

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CONCO heat

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OUTSTANDING FEATURES

SAFE Underwriters' Approved. No liquids used. Fully enclosed heating element. No danger of serious burns.

FAST Reaches full heat in five minutes. Radiation and convection heating provide warmth to all parts of the room.

LIGHT Easily portable. Weighs only 28½ pounds. Carrying handle doubles as drying rack.

ECONOMICAL Heats for one hour for approximately 2 cents, average U. S. rate. *Write for complete information*

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Easy Sales
Extra Profits

Sell VAN-PACKER
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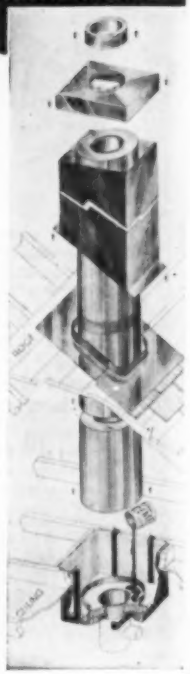
FOR ANY HOME



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  Old homes, new homes, summer cabins, motels, tourist cabins, resorts—there's a vast ready market now.
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  Underwriters' Lab. approved in place of brick. FHA accepted for all fuels in any type home . . . one or two story.
- **Nationally Advertised**
  Thousands of inquiries from our ads are referred to dealers. Selling literature, newspaper mats free.
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  Easily installed, summer or winter by anyone in 3 to 4 hours. Lightweight, needs no foundation. Suspends from ceiling or floor joists. A more efficient chimney with better draft.
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  Easy to handle, minimum stock enables you to supply any 1 or 2 story house with any roof pitch. Furnished complete, all parts for entire installation.
- **Liberal Discount to Dealers**
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...better 5 ways because—

1. Mounts in ceiling directly above stove—instantly catches heat, grease and odors as they rise.
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Write for our Electrical Distribution plan.

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efforts to legalize unfair restraint of trade through conspiracies, to establish and control prices by use of the basing point system. Make it illegal for any corporation to engage in more than one activity when a combination of any two tends to reduce free competition and to promote monopoly.

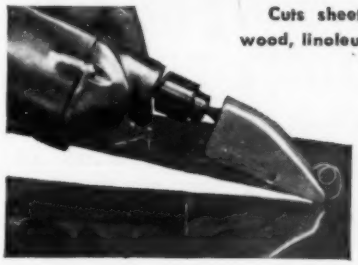
"This is what I call the five-year program for the preservation of free competition and equal opportunity for all American business. This program will be enacted if the independent business man will get behind it with determination not to be satisfied until the entire climate of free enterprise and capitalistic competition are restored.

"Our type of Government, to be successful, requires the interest and participation of the people. Because the majority of our citizens have delegated their responsibilities of citizenship, they are losing out by default. Big Business has long since learned the realities of political action. Our monster corporations maintain adequate and effective representation in Washington, to protect their interests. Labor unions keep close to the Government. The farmers have an admirable group of representative bureaus in Washington. But nowhere do we find effective representation for the protection of the interests of the independent, smaller businesses of America.

"Organized labor became effective in Government when it compiled and publicized the voting records of the politicians and provided campaign funds for those legislators who acted for labor. However, labor has yet to learn and adopt the policy long since followed by big business. That is, do not amalgamate with any party. The only real pressures for effecting political action are, 1, money for political campaigns, and 2, numbers of votes for candidates for office. Concentration and monopolization will be retarded and stopped in its tracks when an integrated program for independent business provides more campaign funds and more votes for the politicians who deliver for small business than these candidates can receive by being representatives of the monopolists. The small business of America has both the numbers and the resources to elect any candidates of its choosing. From a standpoint of votes there is a small business potential of 30 million. The problem is to have these voters with small business interests cast their ballots on a small business platform rather than dissipate their power by voting for Republican or Democratic candidates purely by party. By holding the successful candidates to strict accountability for their actions in Washington, re-election or defeat will be the inevitable result of their keeping or breaking their pre-election commitments to small business.

"A survey made by the Merchants and Manufacturers Association proves the small businessmen of a community have the aggregate power to elect representatives of their choosing. This survey showed that out of the 95,770 businesses in Los Angeles county, more than 92,000 employ fewer than 50 persons each, and 79,838, or 83.4 per cent, have fewer than 10 employees each. There are only 10 companies in the entire county which employ 5,000 persons or more. The association reported: 'The great overwhelming mass of the county's 4 million people depend on a little business for their paychecks.'

ROYAL CLIPPER
METAL CUTTER
Does a Job in a Jiffy
Does a Clean Cut Job



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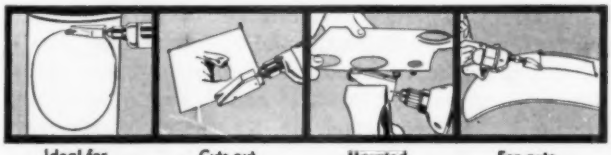

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Should we install a CHORE BOY?
WHY GAS COMPANIES RECOMMEND THIS BURNER
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Yes—we have tested CHORE BOY—You'll make no mistake

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"The numerical preponderance of small business is characteristic of the vast majority of Congressional districts. The individual is no match for monopoly; but the aggregate of all small business in America is the greatest power in the entire world today.

"The dangers facing our opportunities to think as we wish and to develop as we will are just as real today as they were to the colonists who chafed and suffered under British monopoly oppression. We can take a page from the book of the Revolutionary organization and accomplish our salvation with ballots while they were forced to use bullets. We can give our time and money while they gave their lives.

"The National Independent Business Alliance has been formed for this campaign. It will seek the correlation of political activities of all independent trade associations of all industries. It will follow the pattern of 1776. It will have committees of correspondence in every Congressional district of the United States. Supporting these activities are the Minute Men of commerce and industry, the small business men who at the call of the committees lay aside some of their daily work, and pick up their pens to send a barrage of mail and telegrams to their representatives in Washington, and to others who may help in downing the influence of the un-American monopolists.

"The Minute Men of Concord and Lexington were not professional soldiers. They were farmers, carpenters, silversmiths, and some were the equivalent of sheet metal shopowners in their day. The dangers to our American concepts of freedom and equal opportunity are just as real and just as perilous today as they were to the men and women of 1776. Again the fight will have to be made by the small business man, as it was during the Colonial days.

"I call on you today, every one of you, to become Minute Men in this new fight for freedom. I want you to enlist for five years, to pick up your pens at the call of your local committee, and to mark your ballots for those who will preserve America, and not for those who will foster monopoly. If we have the spirit that they had in Lexington and Concord in 1776 we can win this fight in five years."

SMCNA Convention

(From page 119)

codes, read the provisions of a proposed Warm Air Heating Ordinance for licensing persons, firms, or corporations engaging in the warm air heating business. The ordinance provides for an Office of Inspector, Board of Examiners and their duties; applications, examinations, issuance and renewal of licenses; permits, fees, appeal, definitions, and violations and penalties. Its provisions embody desirable features developed from survey of existing codes and ordinances.

Norman J. Fisher, Louisville, Ky., presided over the forum of the Fume Removal-Dust Collecting Committee, and recommended that data be compiled to help the contractor who knows little or nothing about blow pipe work. Mr. Fisher pointed out that lack of knowledge often makes the contractor hesitate to figure this type of work. The first step taken, he suggested, should

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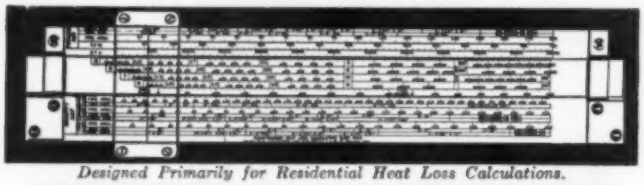

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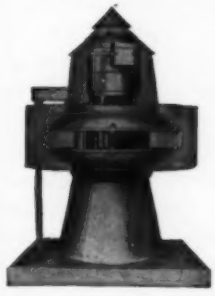

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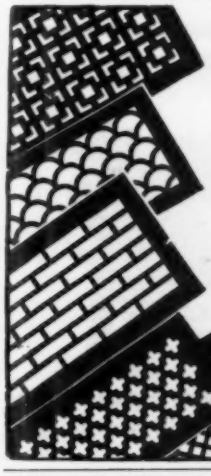

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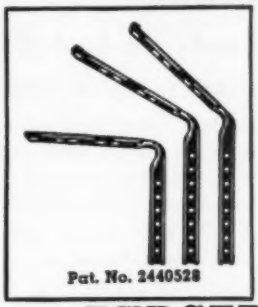

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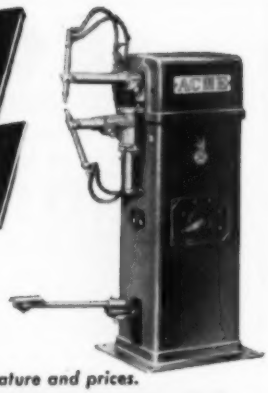

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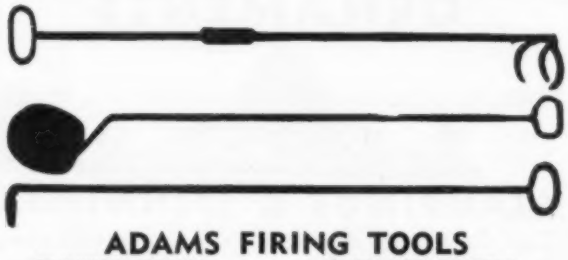

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cover woodworking systems which are required in most communities and are more or less standard. Data should also be compiled on more specialized blow pipe systems such as foundries, grain elevators, sand handling systems, etc.

The chairman called attention to Part 7 of Standard Practice in Sheet Metal Work which is devoted to blow pipe and exhaust systems, and it was the consensus of the forum that this section should be revised. It was pointed that since its publication 20 years ago, blow pipe work has been speeded up considerably and today velocities are probably twice what they were in 1929, hence the need of bringing this chapter up to date, to be of immediate help to sheet metal contractors.

It was also recommended that state codes be studied and the most desirable sections of the best codes be included in the committee's final recommendations.

The architectural sheet metal forum, W. J. Perkinson, chairman, approved the publication of four sections of Standard Practice in Sheet Metal Work. These sections, relating to correct application of architectural sheet metal work, will be available to contractors and others interested in the subject.

The social activities of the convention centered around the Ladies' Program which included sightseeing and shopping tours, cocktail hour, and banquet. Both the delegates and their ladies attended a luncheon Wednesday noon and heard a patriotic address by Jennings Randolph, former Congressman from West Virginia.

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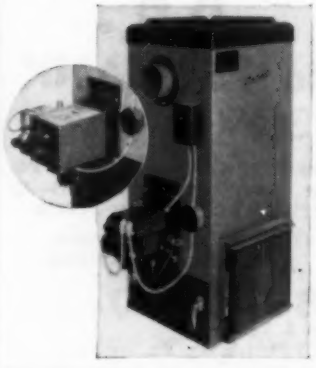

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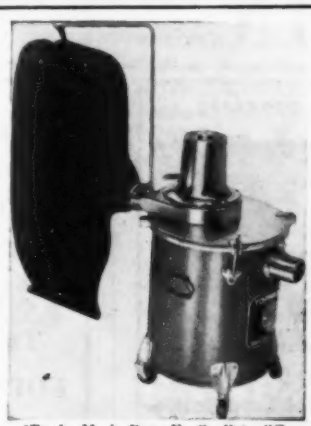

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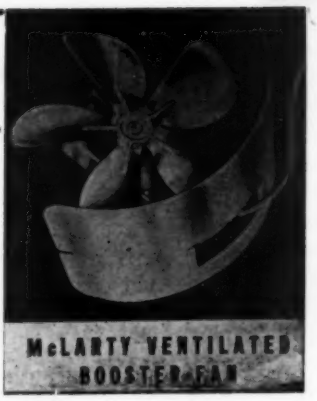

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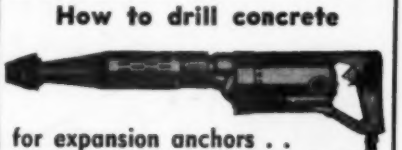

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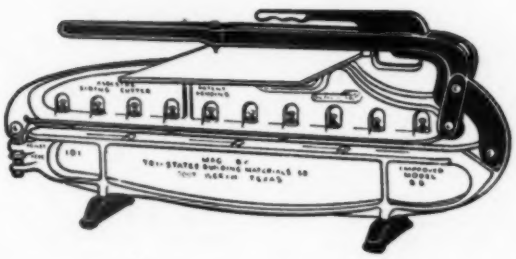

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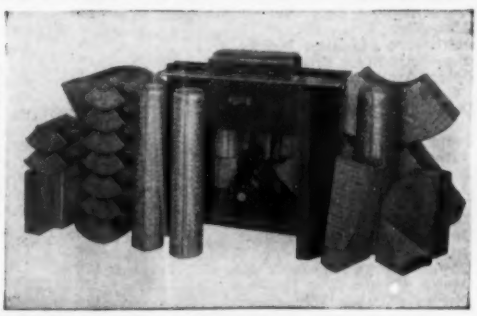

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